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1 of 41

CA-289328

P

C424

11131061/00

JOB ORDER / CONTRACT NO.

REV. NO.

DRAWING NUMBER

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0410
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 800A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE		DRAWING NO.
XXXXX		XXXXX
XXXXX		XXXXX

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

AS-BUILT		BY	DATE			
01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

الشركة الوطنية لنقل الكهرباء

National Grid

CENTRAL REGION BRANCH

DRAWN BY

Tariq

CHECKED BY

Tariq

SCALE

DATE STARTED

30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED

BY

DATE

COVER SHEET

OUTGOING (OHL) FEEDER (2275)

132/33kV # S/S-8501

SAUDI ARABIA

ABB CUBICLE NO.	SEC CUBICLE NO.	EARTH SWITCH NO.				
= AG22						
ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289328	1 of 41	00

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

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CA-289328	1 of 41	00

S:\SWG Projects DRGS\SEC-COA\N106931-04 SS-8170-8178-8833-8501\Detail Design\8501

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SHEET INDEX

Pages	Page name	Rev	Description	Rev	Description	Rev	Description	Rev	Description
=AG22+E/1	COVER SHEET	00	Original	01	As per comments				
=AG22+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG22+E/3	Apparatus List	00	Original	01	As per comments				
=AG22+E/4	Terminal Block Schedule	00	Original	01	As per comments				
=AG22+E/5	Single Line Diagram	00	Original	01	As per comments				
=AG22+E/6	Cubicle Assembly	00	Original	01	As per comments				
=AG22+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG22+E/8	CT CORE1-LINE DISTANCE PROTECTION	00	Original	01	As per comments				
=AG22+E/9	CT CORE2-BACKUP O/C+E/F PROTECTION	00	Original	01	As per comments				
=AG22+E/10	CT CORE3-METERING	00	Original	01	As per comments				
=AG22+E/11	CT CORE4-87B PROTECTION	00	Original	01	As per comments				
=AG22+E/12	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG22+E/13	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG22+E/14	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG22+E/15	ES - INTERNAL WIRING	00	Original	01	As per comments				
=AG22+E/16	BUS VT SUPPLY TO MICOM P546 / REF 615	00	Original	01	As per comments				
=AG22+E/17	AC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG22+E/18	DC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG22+E/19	TRIP CIRCUIT-1 & SUPERVISION	00	Original	01	As per comments				
=AG22+E/20	TRIP CIRCUIT-2 & SUPERVISION	00	Original	01	As per comments				
=AG22+E/21	TRIP RELAY	00	Original	01	As per comments				
=AG22+E/22	CBF STAGE-2 LOCKOUT RELAY	00	Original	01	As per comments				
=AG22+E/23	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG22+E/24	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG22+E/25	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG22+E/26	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG22+E/27	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG22+E/28	CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	00	Original	01	As per comments				
=AG22+E/29	INDICATION CIRCUIT	00	Original	01	As per comments				
=AG22+E/30	CONTACTS TO SCADA INDICATION	00	Original	01	As per comments				
=AG22+E/31	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG22+E/32	SPARE CONTACTS	00	Original	01	As per comments				
=AG22+E/33	SPARE CONTACTS (MICOM P546/REF 615)	00	Original	01	As per comments				
=AG22+E/34	MiCOM P546 - ANALOGUE INPUTS	00	Original	01	As per comments				
=AG22+E/35	MiCOM P546 - COMMUNICATION PORTS	00	Original	01	As per comments				
=AG22+E/36	MiCOM P546 - DIGITAL INPUTS	00	Original	01	As per comments				
=AG22+E/37	MiCOM P546 - OUTPUTS	00	Original	01	As per comments				
=AG22+E/38	REF615 - A/I + Binary I/O Board	00	Original	01	As per comments				
=AG22+E/39	REF615 BINARY INPUTS	00	Original	01	As per comments				
=AG22+E/40	HD4 SPARE CONTACTS	00	Original	01	As per comments				
=AG22+E/41	HD4 INTERNAL WIRING	00	Original	01	As per comments				

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1	2	3	4	5	6	7	8
Item Number	Component number	Object description	Comp. Qty (CUn)				
+A-Q0	HD4-401225-125V	SF6 CB:HD4/Z40.12.25(FOR ZS3.2-125VDC	1	+C-VTF1,2,3	AE4754-2000-02	VT pri FUSE ZS3.2-36KV2A type17CAV,440MM	3
+C-CT1-3	CT-N106931-33KVOHL	ABB EJP : TPU73.63 BIL:36/70/170kV, Frequency : 60Hz. Ambient temp: 40C Ith : 25kA (1 sec) IDYNAMIC/Peak :65kA (2.6 times the Ith as per IEC for 60hz). Thermal over current factor: 1.2 for single ratio Primary terminal silver plated. Secondary Reconnect able CORE 1- RATIO : 400-800/1A CLASS : 5P20 BURDEN : 22.5VA - 45VA Rct : 1 Ohm - 2 Ohms CORE 2- RATIO : 400-800/1A CLASS : 5P10 BURDEN : 15-30VA Rct : 1 Ohm - 2 Ohms CORE 3- RATIO : 400-800/1A CLASS : 0.2Fs5 BURDEN : 15-30VA CORE 4- RATIO : 2000/1A CLASS : PX Vkp : 350V Io : 30mA Rct : 5 Ohms	3	+C-EC	AE5858-2004-AB	SPACE HEATER 220V AC, 150-200W	1
				+C-Q2	GCE7005552R0101	EARTH SWITCH-EK6, 36KV, 31.5KA	1
				+C-Q2.Y8	GCE9401766P0107	BLOCKING MAGNET, 125VDC	1
				+D-D1	MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1
				+D1-98	MV RK 271 007-AN	RXSF1, 2 (2NO+1NC) HAND RESET FLAG	1
				+D1-F98	MV-RXBA4-120VAC	3PH. FUSE SUPERVISION RELAY: RXBA4	1
				+D1-F52X	MV RK 251 401-AP	BISTABLE RELAY, RXMVB 4 : RK 251 401-AP	1
				+D1-741-4	MV RS 702 290-AA	SPER1C1/E255:RS 702 290-AA -w/o LED-TCS	4
				+D1-74DC	MV RK 271 019-AN	RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-74RDC	MV RK 271 019-AN	RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-74TC	MV RK 271 019-AN	RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-TS1	MV RK 926 315-AG	TEST SWITCH, TYPE:RTXP24 (RK 926 315-AG)	1
				+D1-TS2	MV RK 926 115-BF	RELAY TEST SWITCH: RTXP18:RK 926 115-B	2
				+D1-TS87B	MV RK 926 002-AD	RTXP8	1
				+D-CVI	1YAB010028R0105	CVI(VOIS)36/40.5kV COMPLET W. INSULATORS	1
				+D-F1	P54631NK6M0710M	P546-Current Differential with Distance	1
				+D-F2	HBFAEAGNEA1BAA1XE	REF615 -4I+5U-16BI+10BO+IEC61850	1
				+D-F86CBF	MV-MVAJ105RA0802	Lockout Relay for CBF stage-2(8 NO + 2 NC)	1
				+D-F94	MV-MVAJ101-RA-0802	MVAJ101 , (8 NO + 2 NC)	1
				+D-H1	LED-125V-RESDIOD-R	LED48 -125VDC, Resist+Diode22 DIA, RED	1
				+D-H2	LED-125V-RESDIOD-G	LED48 -125VDC, Resist+Diode22DIA, GREEN	1
				+D-H3-4	LED-125V-RESDIOD-W	LED48-125VDC, Resist+Diode 22 DIA,WHITE	2
				+D-H5	LED-125V-RESDIOD-Y	LED48-125VDC, Resistor+Diode,22D,YELLOW	1
+C-VT1,2,3	TJP7-N106931-VT	TYPE : TJP7.1 AS PER LATEST IEC STD. SPECS. Ambient Temp: 40C BIL : 36/70/170kV FREQUENCY : 60Hz PRIMARY VOLTAGE : 33000/1.732V SECONDARY VOLTAGE1 WINDING : 110/1.732V BURDEN : 25VA CLASS : 0.2/3P SECONDARY VOLTAGE2 WINDING : 110/1.732V BURDEN : 25VA CLASS : 0.2/3P VOLTAGE RATING FACTOR : 1.9xUn for 8HOURS :1.2 x Un CONTINUOUS	3	+D-P1	MV-V96LI-110-33KV	VOLTMETER, Type: V96LI-VT-A, 33000/110KV	1
				+D-P2	MV-A96LI-1A-800-DS	AMMETER, Type : A96LI-CT-A, 800-400/1A	1
				+D-P3	MV-M96D-1A-800-DS	MDI(built-in CT)Type: M96D_30,800-400/1A	1
				+D-S1	CA10-A216-FUAP530	CB OPEN-NORMAL-CLOSE-Padlock.red handle	1
				+D-S2	CA10-A223-FUAP531	BREAKER MODE SW. LOC/REM 20A 4P 2Positn	1
				+D-S3	CA10-A260-FUAP534	Space heater SW "Off-Auto-Manual" (K&N)	1
				+D-S4	CA10-A204-FUAP535	Lamp Test Switch (K&N)	1
				+D-S5	CA10-A007-VMTR	Voltmeter Sel. Switch (K&N)	1
				+D-S6	CHR10-A038-AMTR	Ammeter Selector Switch (K&N)	1
				+D-S79	CA10-A223-FUAP572	A/R IN-OUT SEL. SWITCH (K&N)	1
				+D-S86	MV-1SFA616100R4076	PB Black 1NO+1NC-22 dia-1SFA611100R4076	1
				+D-TSM	MV-129A514G01	FT-1 SW-FOR METERING CT/VT ISOL.(6C+4P)	1
				+E-E2	DMS 3110	THERMOSTAT 24,48,60,115 & 230V	1
				+E-E4	MV 5911 0818-01	FLUORESCENT LAMP WITH DIFFUSER, 120VAC	2
				+E-EC	GCE0990162P0101	PANEL HEATER 240V,50W-Boxin-3Met.Cable	1
				+E-F11-15	MV-S 282 UC-K6	MCB 6A DC -2P	5
				+E-F16-17	MV-S 202-K6	MCB 2 POLE 6A -AC	2
				+E-F20-21	MV-S 203-K10	MCB 3 Pole 10 Amp.	2
				+E-F22-27	MV-S 203-K4	MCB -3POLE-4A -AC	6
					MV-S2C-H11L	.Ux contact 1NO+1NC AC -MCB	2
					MV-S2-H11	Aux contact for DC MCB 1No+1NC	5
					MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1
					DMS 924 0004	COMBIFLEX TERMINAL BASE RX 2H (4U 6C)	1
					DMS 924 0002	COMBIFLEX TERMINAL BASE RX4 (4U 12C)	1

01	As per comments	Tarig	14/13	 الشركة الوطنية لنقل الكهرباء National Grid sa	Prepared Tariq	Date	30.12.2012	Title OUTGOING (OHL) FEEDER (2275) Apparatus List  ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No.	N106931.004	= AG22
00	Original	Tarig	01/13		Checked Tariq	Approved	S.Moin		Drg. No.	CA-289328	+ E
Rev.	Description	By	Wk/Yr		Project name				Design No.		Lang.
CENTRAL REGION BRANCH				132/33kV # S/S-8501 ZS3.2					Page		3
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TERMINALS

NAME	TYPE	REMARK	QUANTITY	FUNCTION
X3	USST4		13	CONTROL CIRCUIT
X4	USST4		25	CONTROL CIRCUIT
X5	USST4		96	CONTROL CIRCUIT
X5.1	USST4		99	CONTROL CIRCUIT
X7	WTR-4SL		99	SCADA CIRCUIT
X7.1	WTR-4SL		9	SCADA CIRCUIT
X11	OTTA6-T-P/P		16	CT CIRCUIT
X12	OTTA6-T-P/P		16	CT CIRCUIT
X13	OTTA6-T-P/P		22	CT CIRCUIT
X14	OTTA6-T-P/P		13	CT CIRCUIT
X52	USST4		53	CB CIRCUIT
X87	OTTA6-T-P/P		10	CT CIRCUIT
X2	WTL6SL		36	VT CIRCUIT

				Prepared Tariq	Date 30.12.2012	Title	ABB Job No. N106931.004	= AG22
				Checked Tariq	Approved S.Moin	OUTGOING (OHL) FEEDER (2275) Terminal Block Schedule	Drg. No. CA-289328	+ E
01	As per comments	Tariq	14/13	Project name 132/33kV # S/S-8501 ZS3.2			Design No.	Lang. EN
00	Original	Tariq	01/13	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.				Page 4
Rev.	Description	By	Wk/Yr					CENTRAL REGION BRANCH

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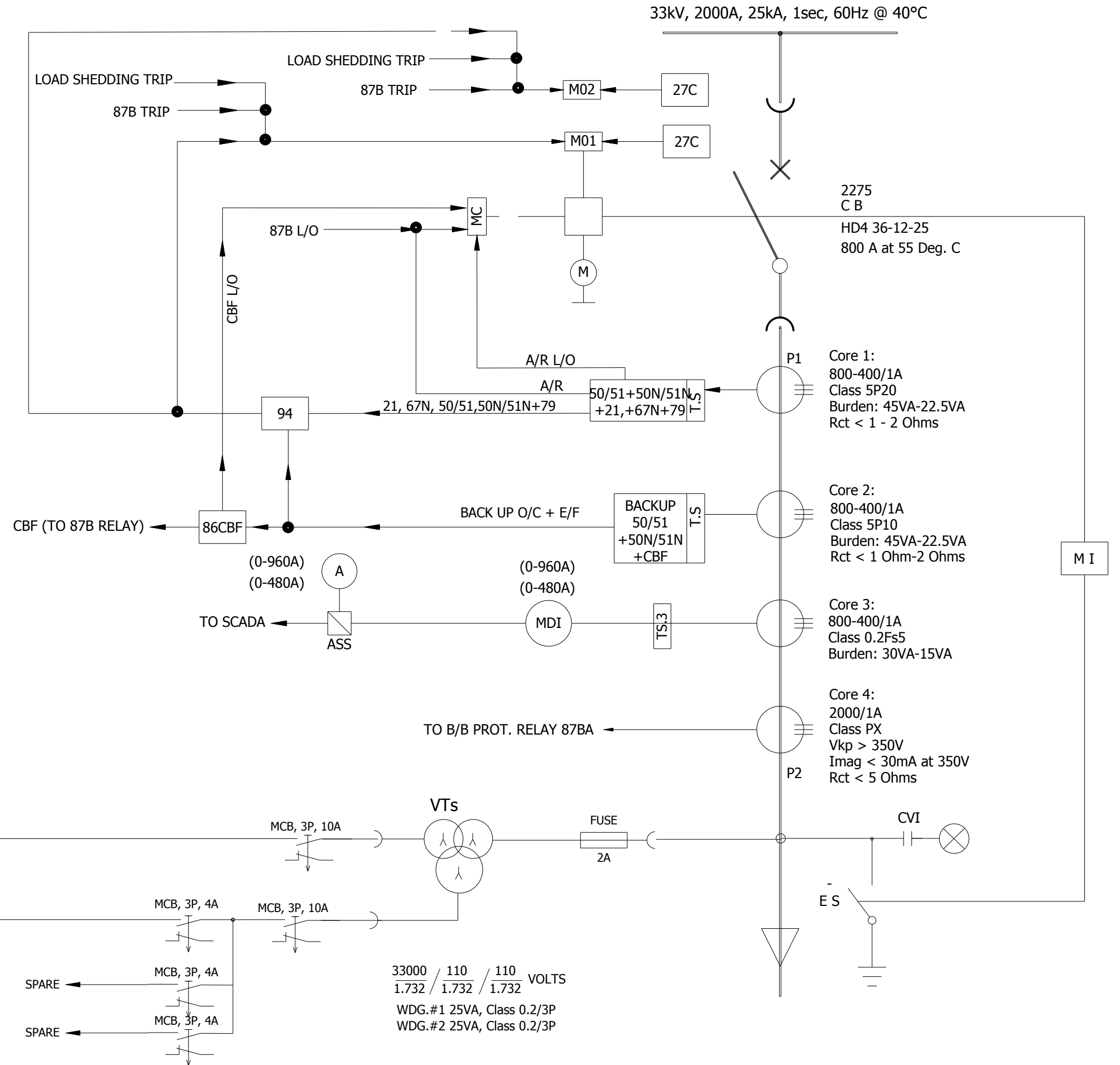
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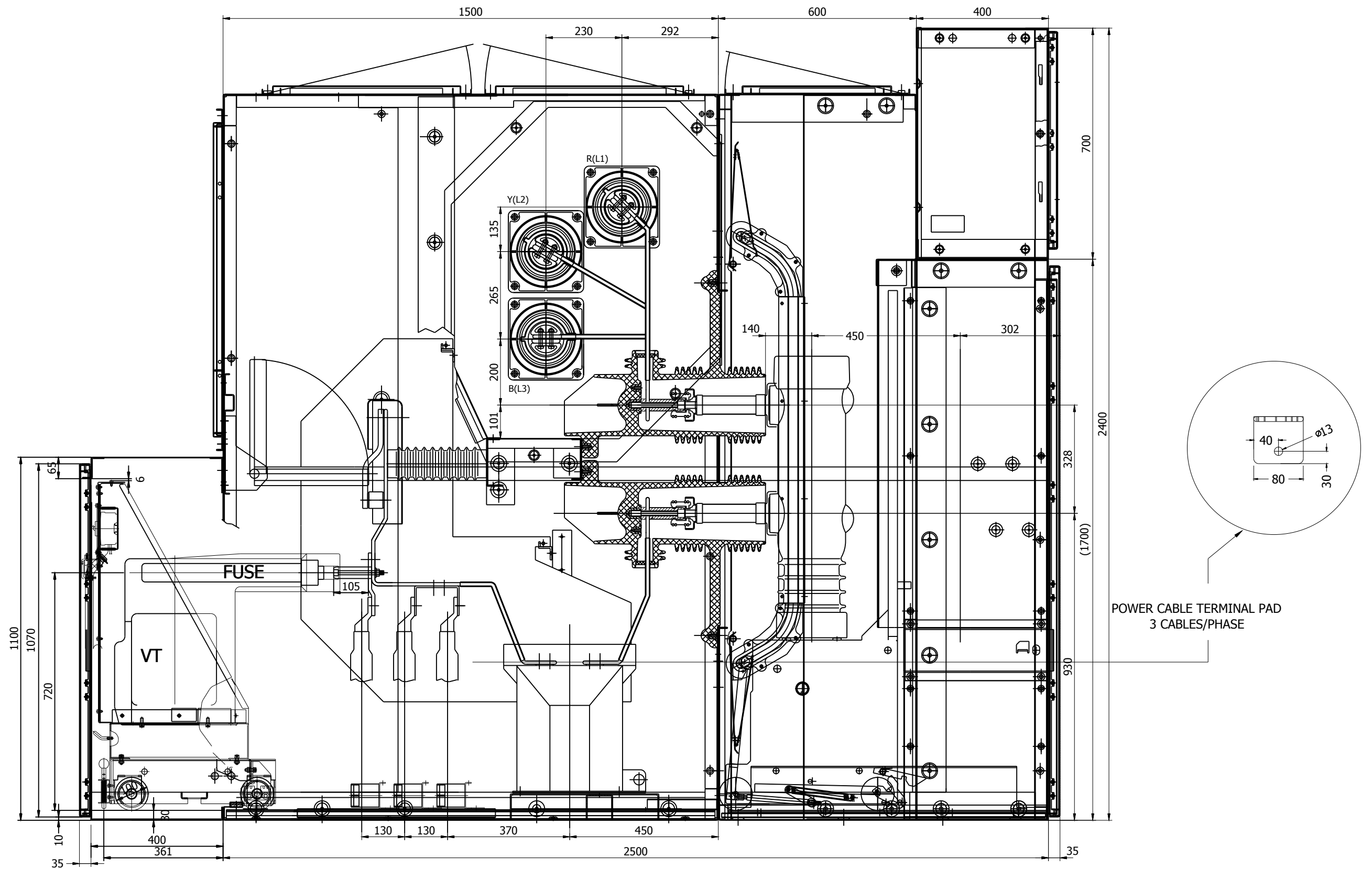
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LEGEND :

- 50/51 - Line Distance protection relay, Type: MICOM P546
+50N/51N With Directional E/F prot. and autorecloser
+21+67N+79
- 51/51N - Over current & Earth fault relay, Type: REF 615
- 94 - Trip Relay, type: MVAJ101
- 86CBF - CBF Stage-2 Lockout relay, type: MVAJ105
- 27C - Trip circuit supervision relay, Type: SPER 1C1
with No-Volt flag indication relay, Type: RXSF1
- T.S - Relay test block, type : RTXP24
- C.T. - Current Transformer
- V.T. - Voltage Transformer
- A - Ammeter, 96X96 Long scale, Class 1.5
- MDI - Maximum demand indicator, 96x96
quadrant scale, Class 3, , Time lag= 30min.
- ASS - Ammeter selector switch, 4-position
- V - Voltmeter
- VSS - Voltmeter selector switch
- F98 - Fuse Supervision relay, RXBA4
- M01,M01 - Tripping coil
- MC - Closing coil
- E S - Earthing switch
- C B - Circuit Breaker
- CVI - Capacitive Voltage Indicator
- M I - Mechanical interlock
- M - CB charging motor



Prepared Tariq		Date 30.12.2012		Title		ABB Job No. N106931.004		= AG22	
Checked Tariq		Approved S.Moin		OUTGOING (OHL) FEEDER (2275)		Drg. No. CA-289328		+ E	
Project name		132/33kV # S/S-8501		Single Line Diagram		Design No.		Lang. EN	
Rev.		By Wk/Yr		Description		ABB ELECTRICAL INDUSTRIES CO. LTD.		Page 5	
1		2		3		4		5	
01 As per comments		Tariq 14/13		CENTRAL REGION BRANCH		6		7	
00 Original		Tariq 01/13		ZS3.2		8		8	
Rev.		By Wk/Yr		Description		ABB		Pages 41	



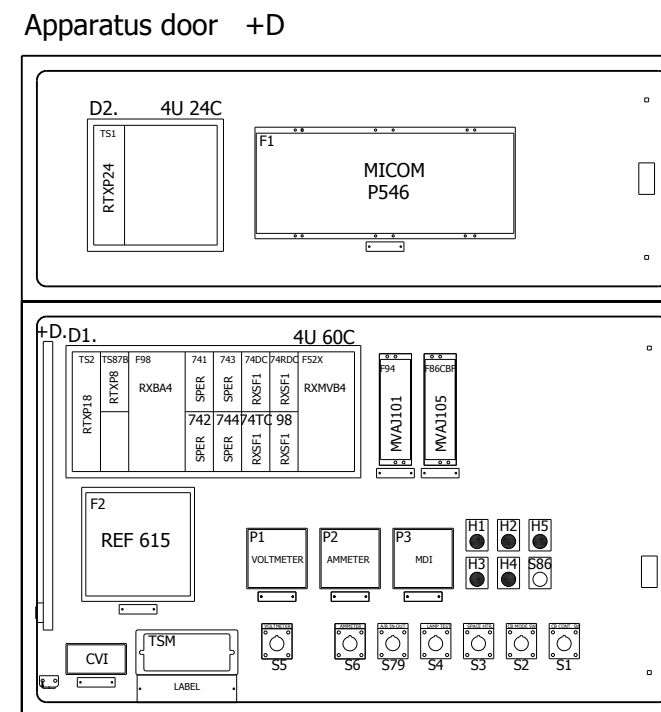
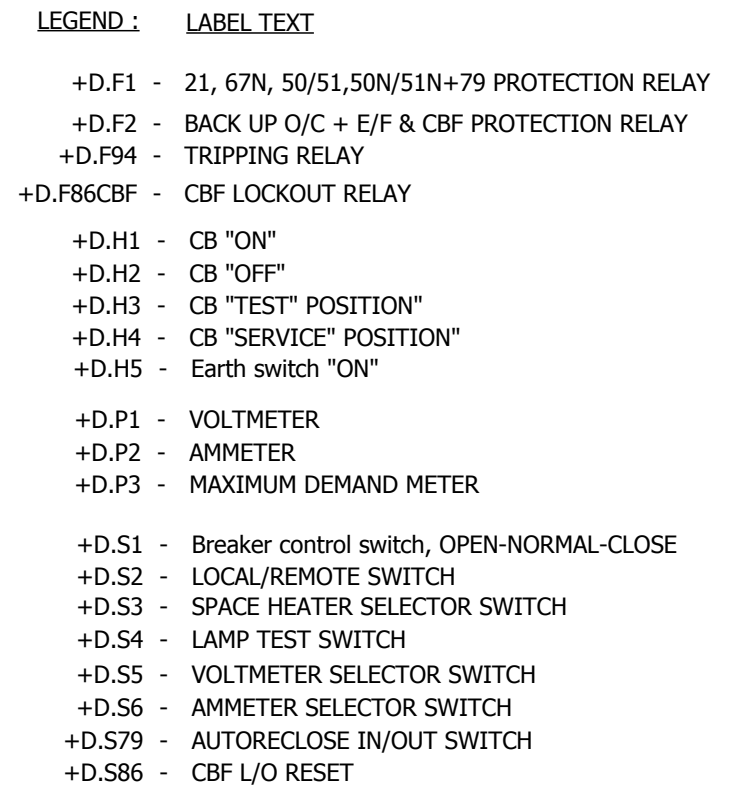
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00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr



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National Grid sa
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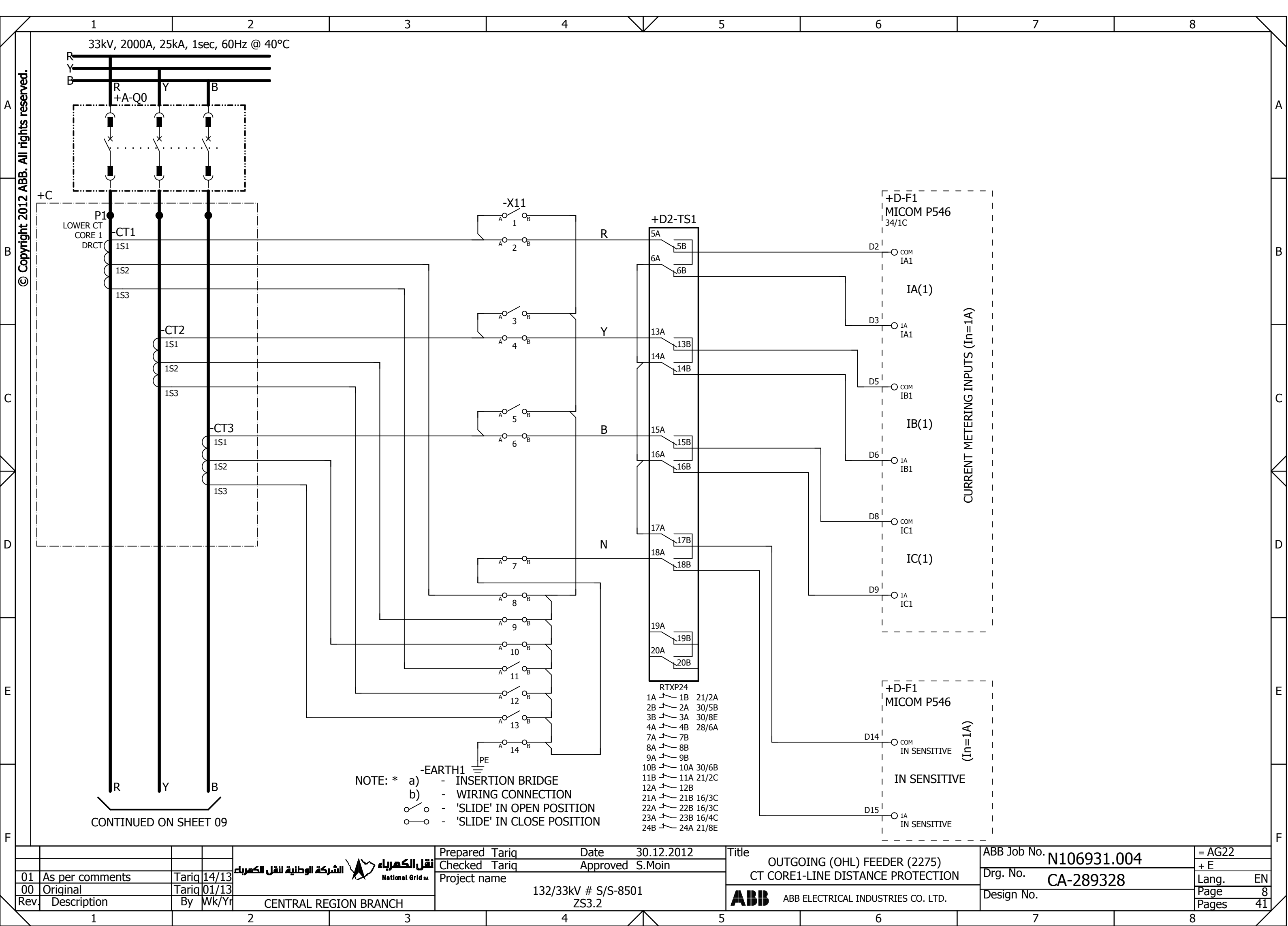
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Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (2275) Cubicle Assembly
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG22
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				 الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date	30.12.2012	Title	OUTGOING (OHL) FEEDER (2275) Low Voltage Box Arrangement	ABB Job No.	N106931.004	= AG22
					Checked Tariq	Approved	S.Moin					
01	As per comments	Tariq	14/13		Project name	132/33kV # S/S-8501 ZS3.2	 ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	CA-289328	Lang.	EN	
00	Original	Tariq	01/13									
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH							Page	7
											Pages	41



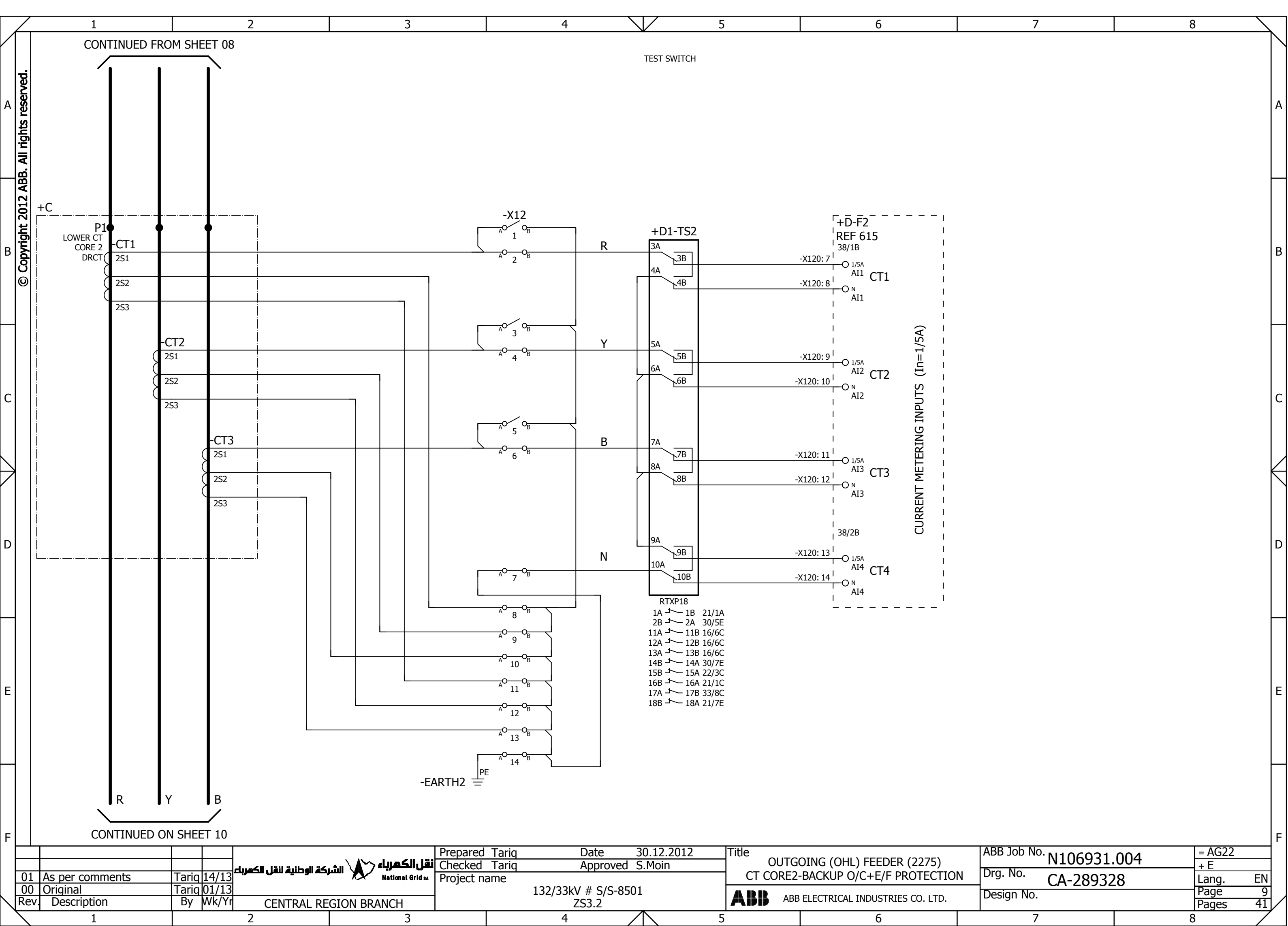
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01	As per comments	Tariq	14/13
00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr
			CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (2275) CT CORE1-LINE DISTANCE PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG22
Drg. No.	CA-289328	+ E
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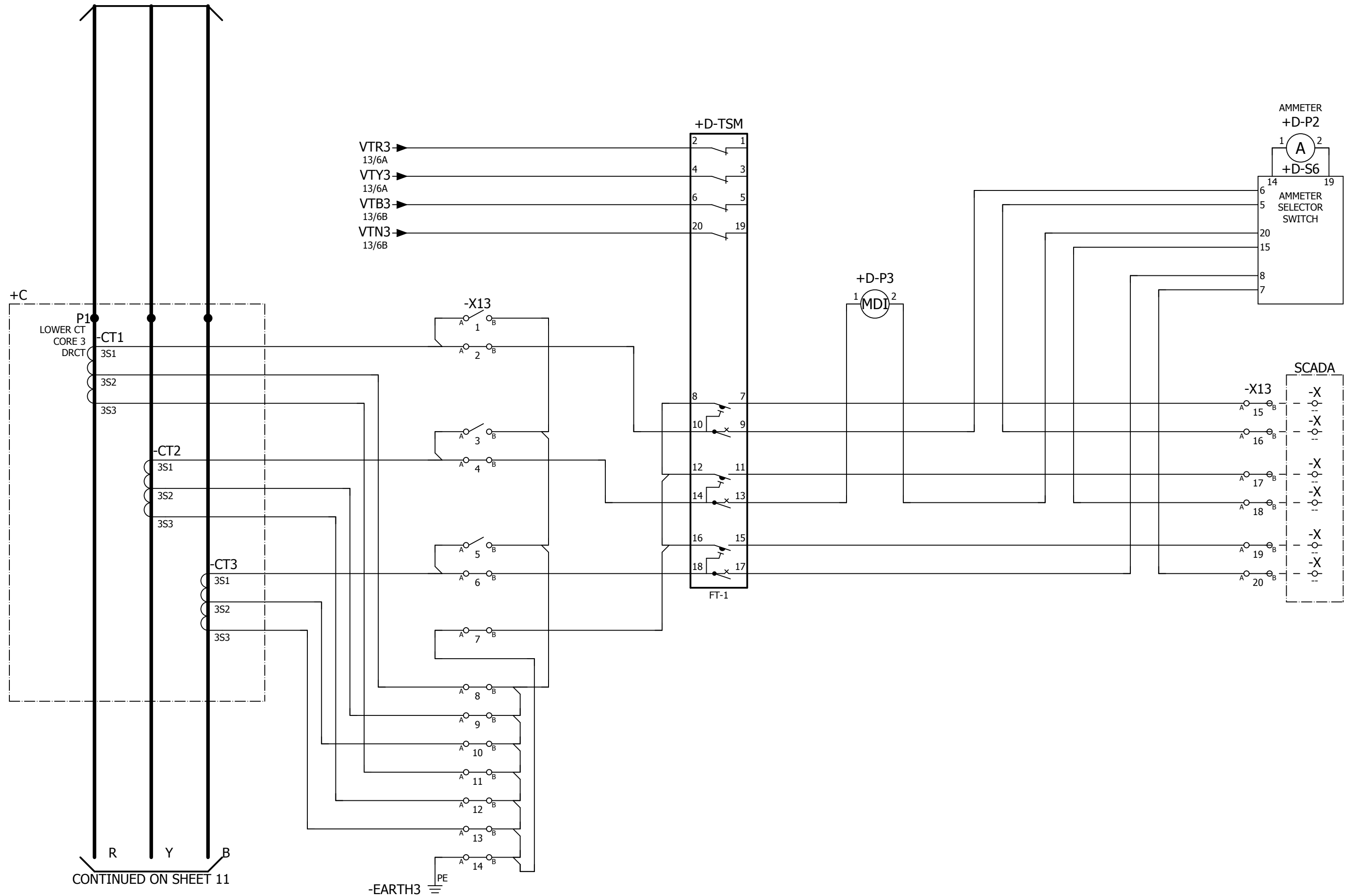
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00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr


Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

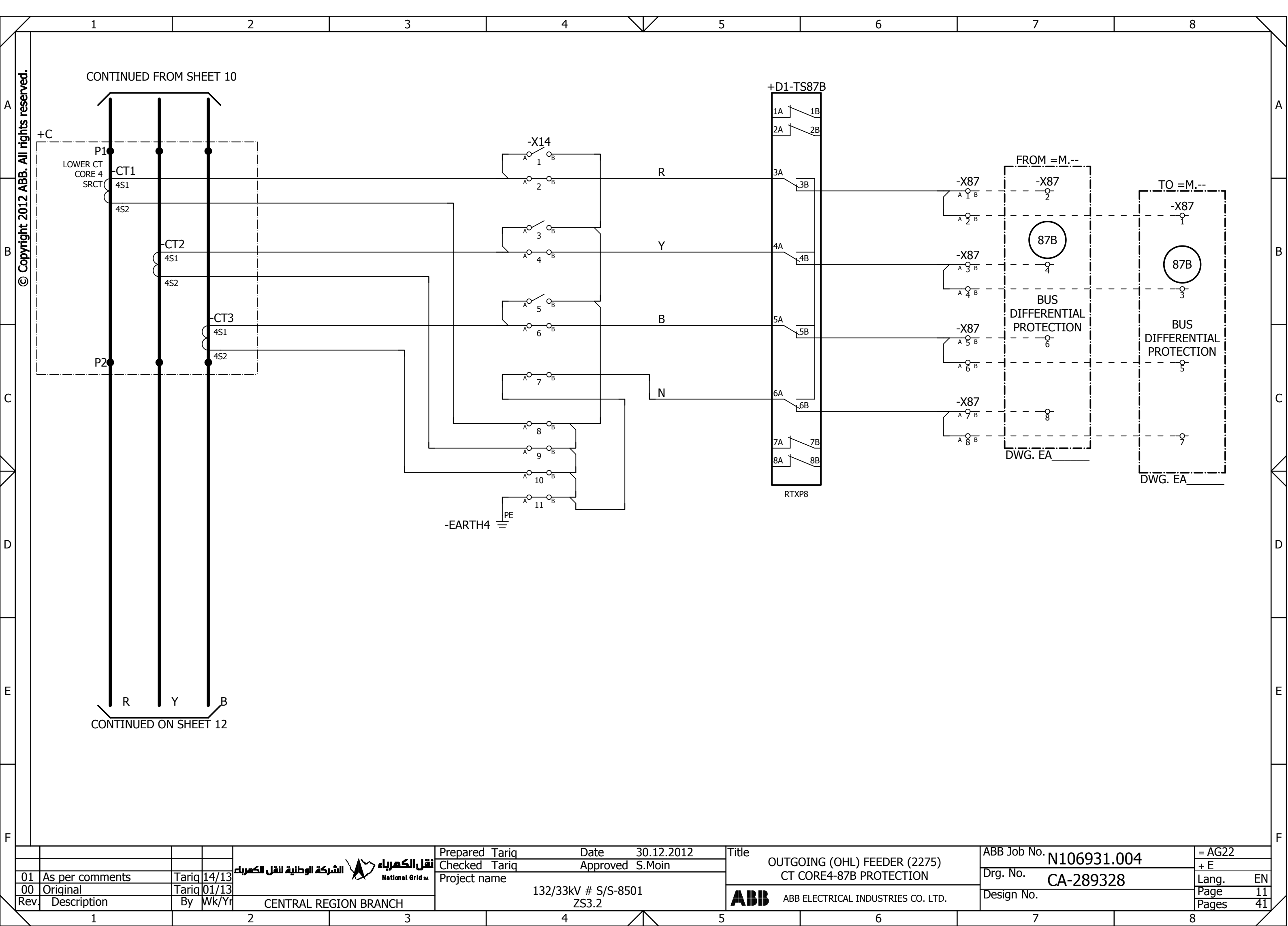
Title	OUTGOING (OHL) FEEDER (2275) CT CORE2-BACKUP O/C+E/F PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG22
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				 الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq _____ Date 30.12.2012	Title OUTGOING (OHL) FEEDER (2275) CT CORE3-METERING	ABB Job No. N106931.004 = AG22	
					Checked Tariq _____ Approved S.Moin			Drg. No. CA-289328 + E
01	As per comments	Tariq	14/13		Project name			
00	Original	Tariq	01/13	132/33kV # S/S-8501	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Page 10	
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				ZS3.2



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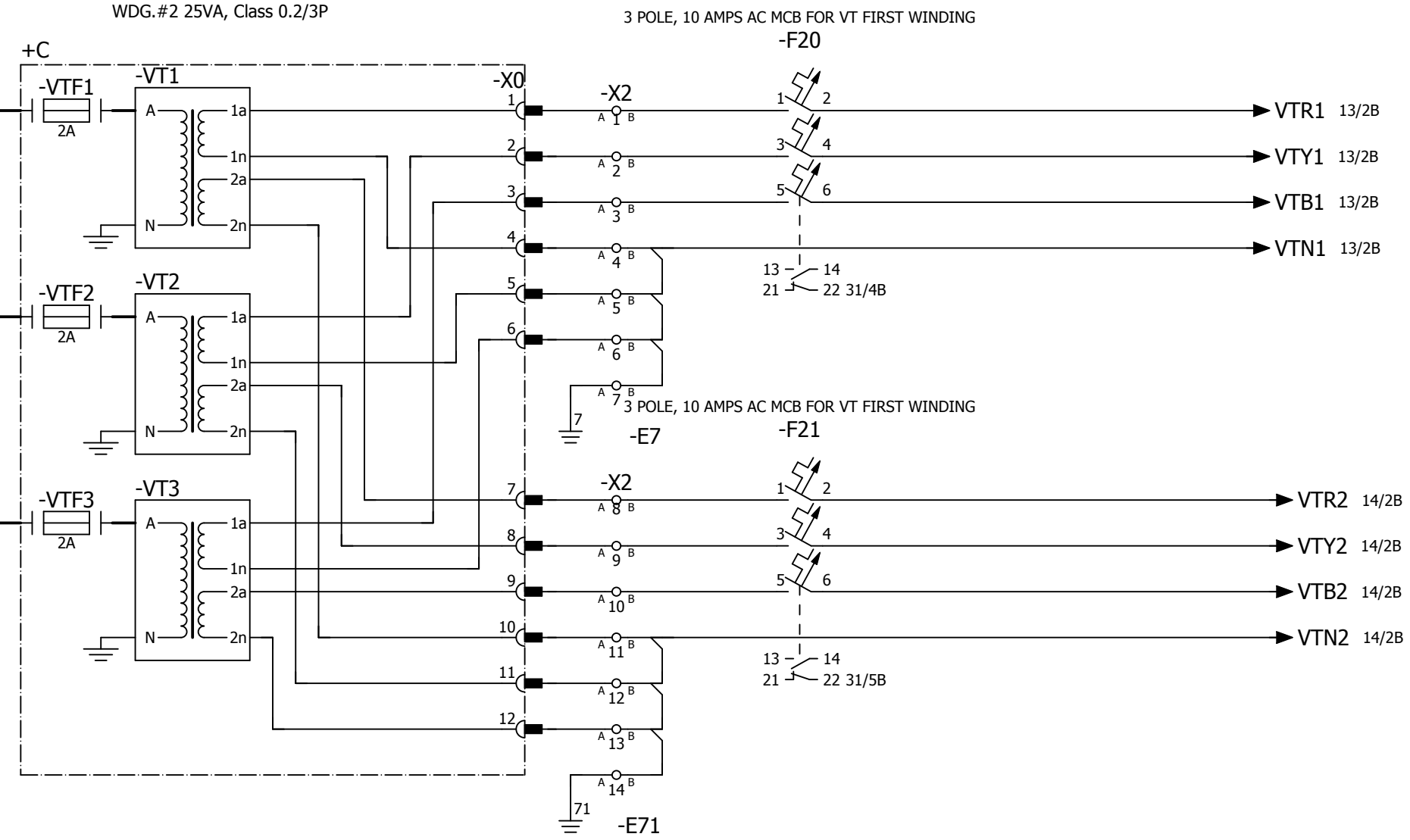
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				Checked Tariq	Approved S.Moin	OUTGOING (OHL) FEEDER (2275)	Drg. No. CA-289328	+ E
01	As per comments	Tariq	14/13	Project name 132/33kV # S/S-8501		CT CORE4-87B PROTECTION	Design No.	Lang. EN
00	Original	Tariq	01/13					Page 11
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Withdrawable VT Truck in Cable Compartment

$\frac{33000}{1.732} / \frac{110}{1.732} / \frac{110}{1.732}$ VOLTS
WDG.#1 25VA, Class 0.2/3P
WDG.#2 25VA, Class 0.2/3P



CONTINUED ON SHEET 13

				<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING (OHL) FEEDER (2275) VOLTAGE TRANSFORMER CIRCUIT	ABB Job No.	N106931.004	= AG22	
					Checked Tariq	Approved S.Moin				+ E	
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			 ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289328	Lang.
00	Original	Tariq	01/13						Design No.		Page
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH						Pages	41

Prepared Tariq	Date	30.12.2012
Checked Tariq	Approved	S.Moin
Project name		
132/33kV # S/S-8501 ZS3.2		

ABB Job No.	N106931.004	= AG22
Drg. No.	CA-289328	+ E
Design No.		Lang. EN
		Page 13
		Pages 41

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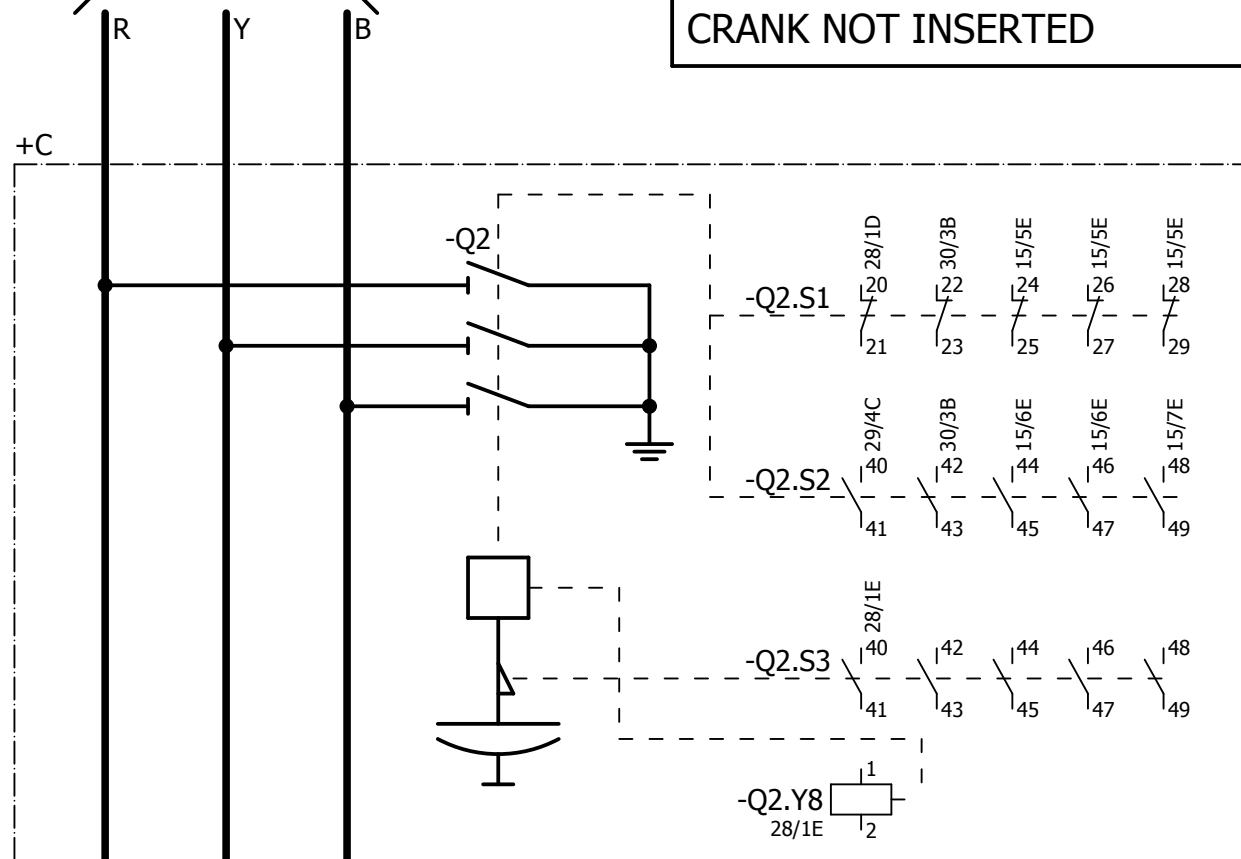
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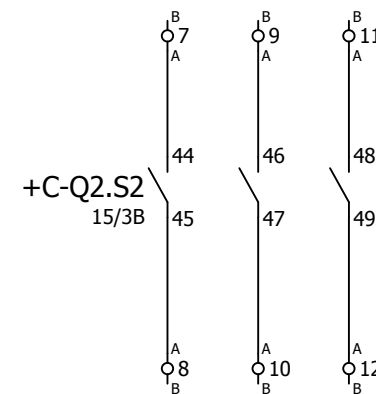
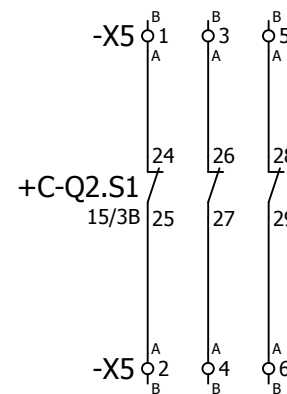
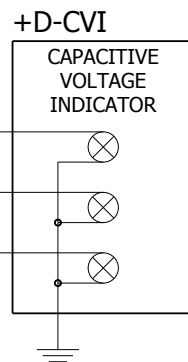
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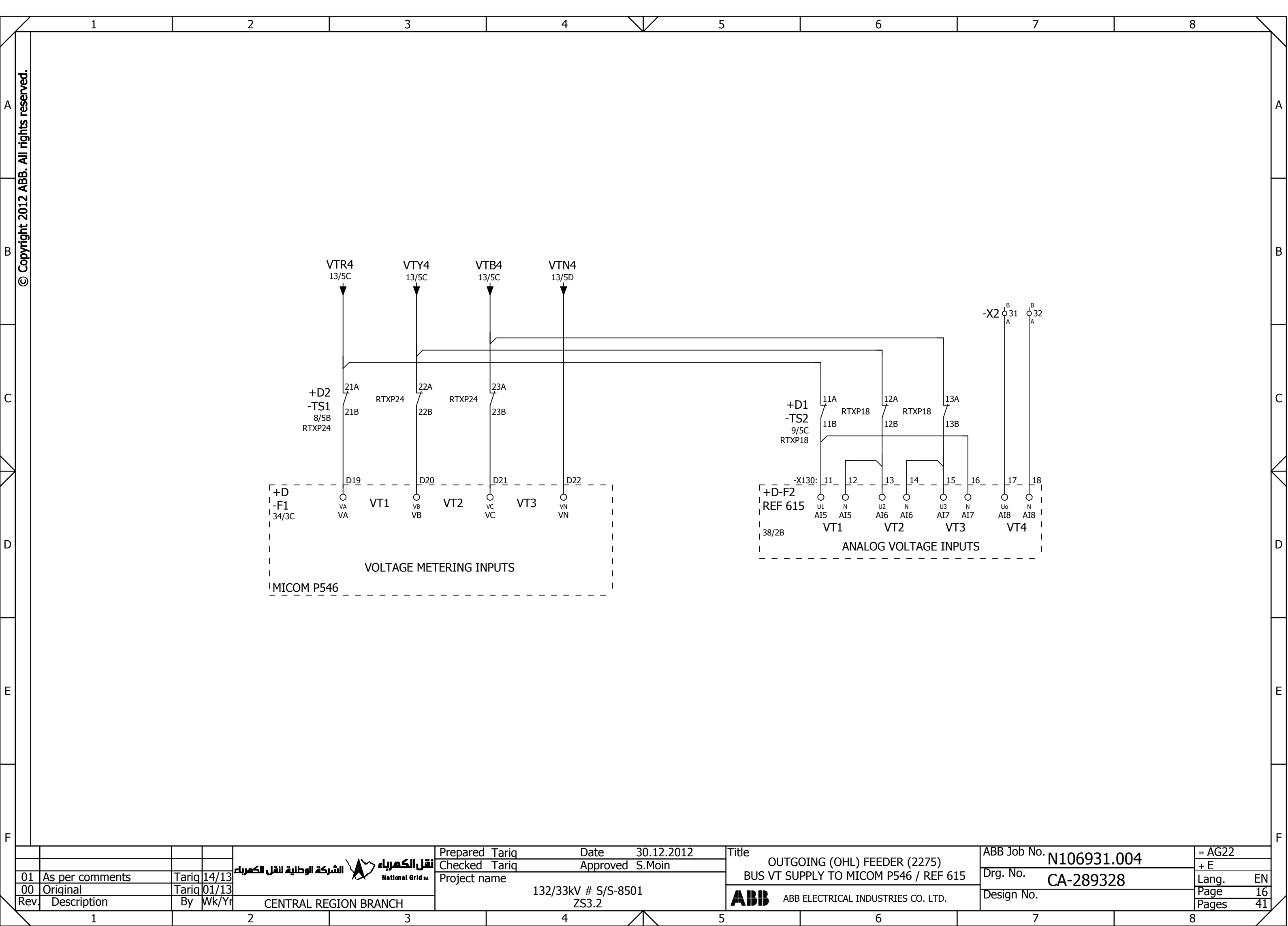
CONTINUED FROM SHEET 12

EARTHING SWITCH OFF AND CRANK NOT INSERTED



DESIGNATION	DESCRIPTION
-Q2.S1	EARTHING SWITCH OFF AND CRANK NOT INSERTED
-Q2.S2	EARTHING SWITCH ON
-Q2.S3	CRANK INSERTED
-Q2.Y8	EARTHING SWITCH BLOCKING COIL





				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG22
				Checked Tariq	Approved S.Moin	OUTGOING (OHL) FEEDER (2275)	N106931.004	+ E
01	As per comments	Tariq	14/13	Project name		BUS VT SUPPLY TO MICOM P546 / REF 615	Drg. No.	Lang. EN
00	Original	Tariq	01/13				CA-289328	Page 16
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 41



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				<div><div><div><div></div><div>الشركة الوطنية لنقل الكهرباء</div></div><div><div><div></div><div>National Grid SA</div></div></div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING (OHL) FEEDER (2275) DC SUPPLY CIRCUITS	ABB Job No.	N106931.004	= AG22	
					Checked Tariq	Approved	S.Moin					+ E	
01	As per comments	Tariq	14/13		Project name							Drg. No.	CA-289328
00	Original	Tariq	01/13					132/33kV # S/S-8501			<div><div><div></div><div>ABB</div></div></div> ABB ELECTRICAL INDUSTRIES CO. LTD.		
Rev.	Description	By	Mk/Yr	CENTRAL REGION BRANCH	ZS3.2								Pages

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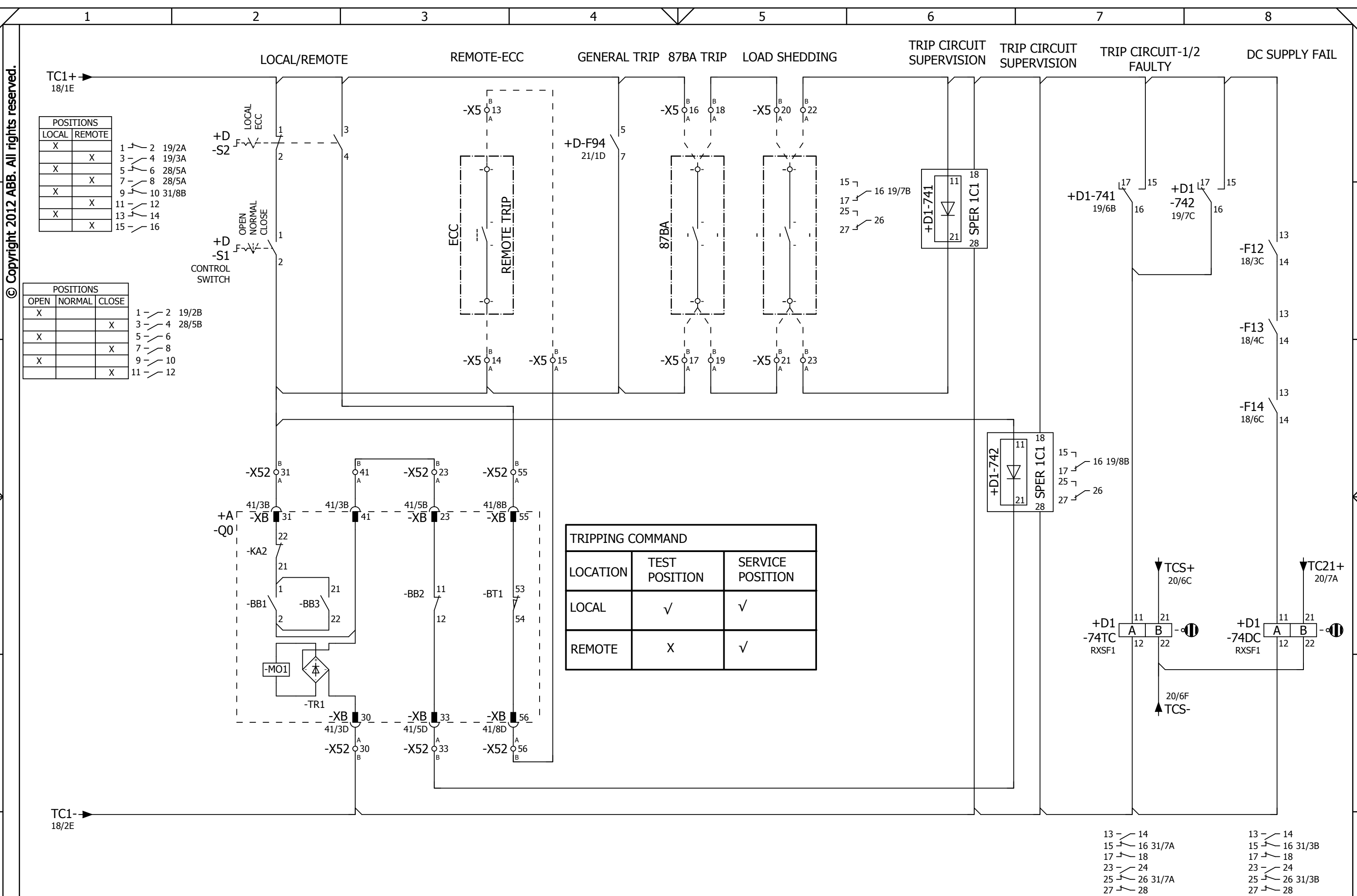
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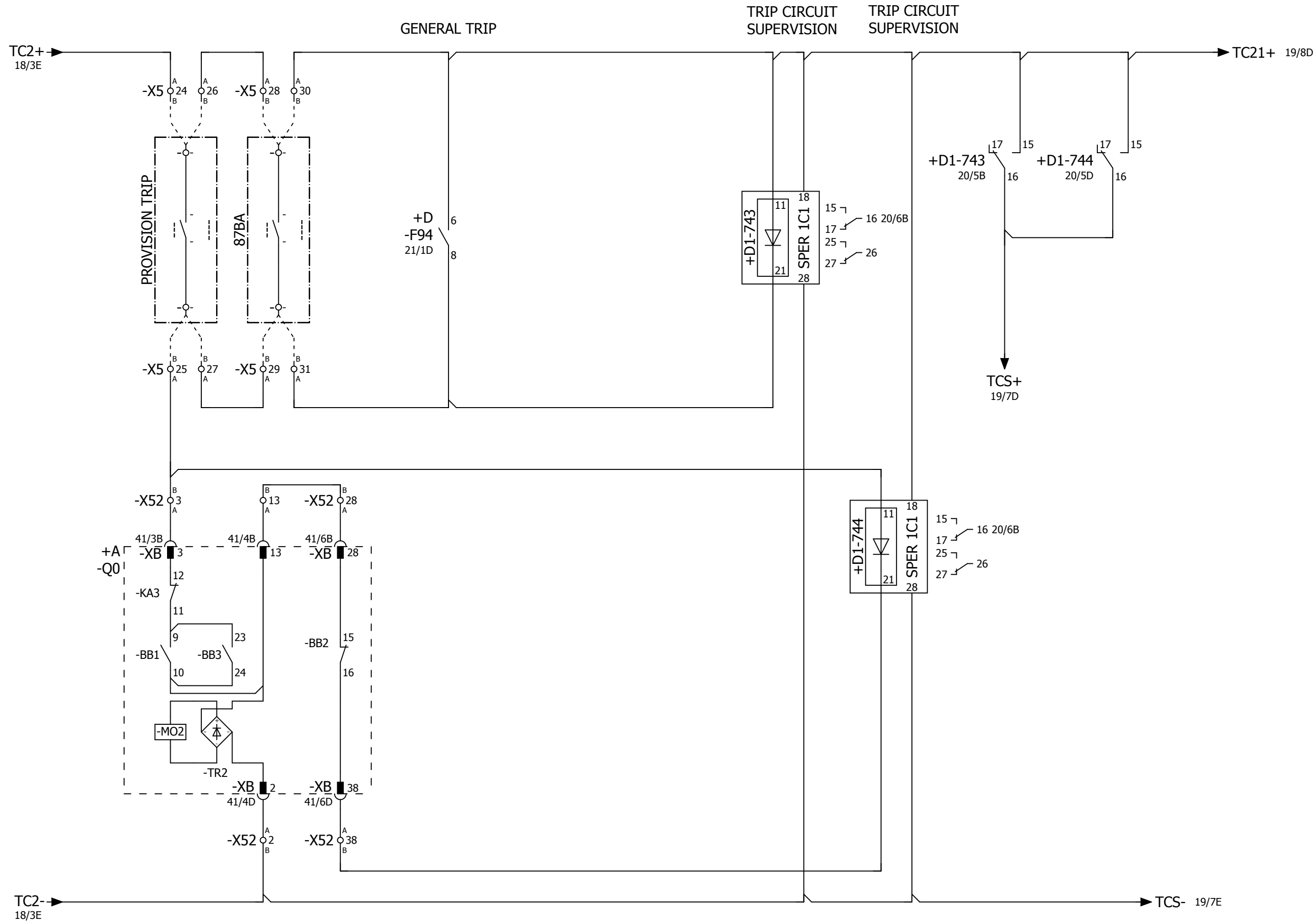
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					Checked Tariq	Approved S.Moin				+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Drg. No.	CA-289328
00	Original	Tariq	01/13					Design No.		Page 19
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00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr

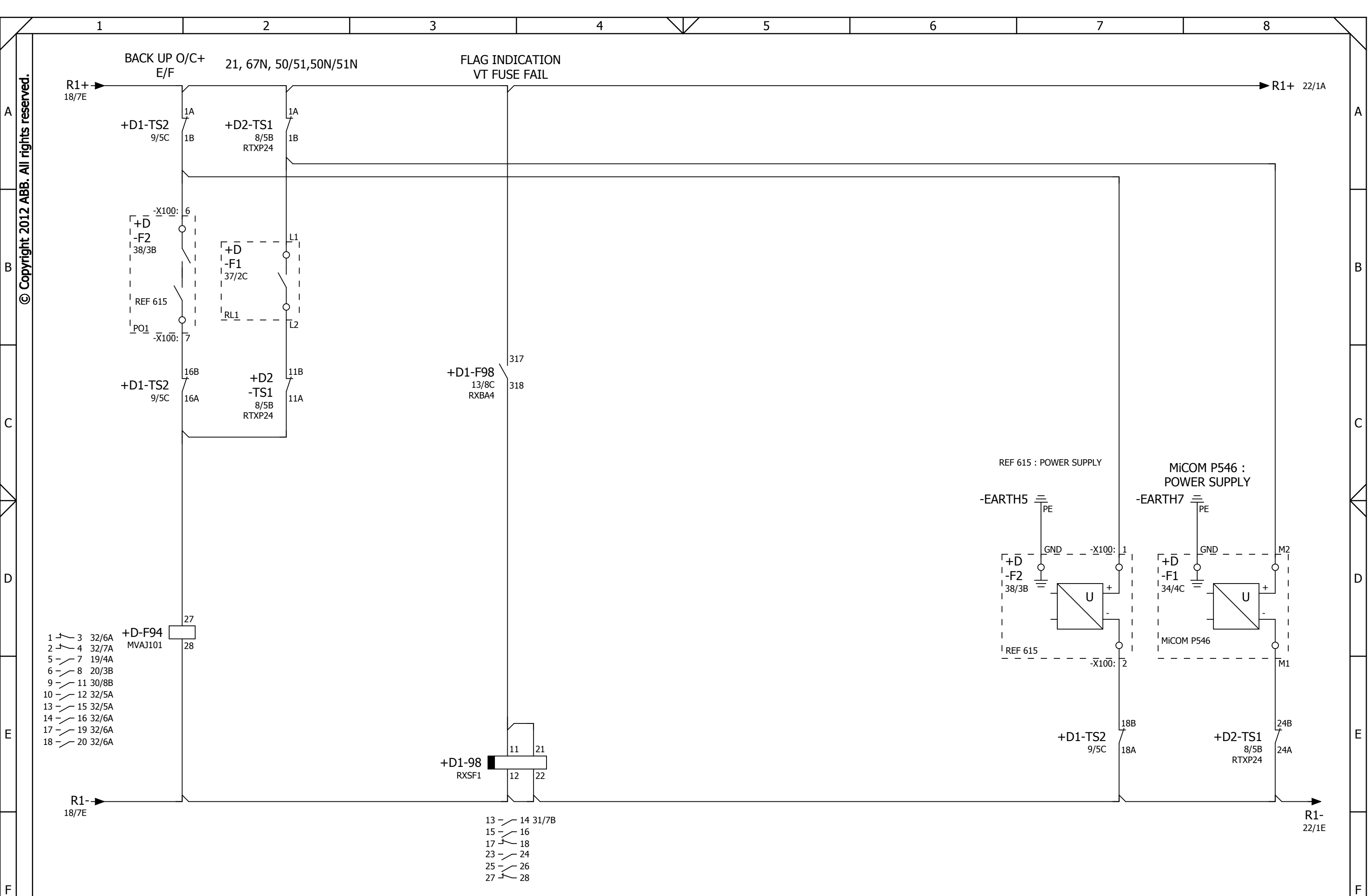
الشركة الوطنية لنقل الكهرباء
National Grid sa



CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (2275) TRIP CIRCUIT-2 & SUPERVISION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG22
Drg. No.	CA-289328	+ E
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				 نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date	30.12.2012	Title	OUTGOING (OHL) FEEDER (2275) TRIP RELAY	ABB Job No.	N106931.004	= AG22
					Checked Tariq	Approved	S.Moin					Drg. No.
01	As per comments	Tariq	14/13		Project name	132/33kV # S/S-8501 ZS3.2	 ABB ELECTRICAL INDUSTRIES CO. LTD.			Lang.	EN	
00	Original	Tariq	01/13								Design No.	
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH						Pages	41	

الشركة الوطنية لنقل الكهرباء

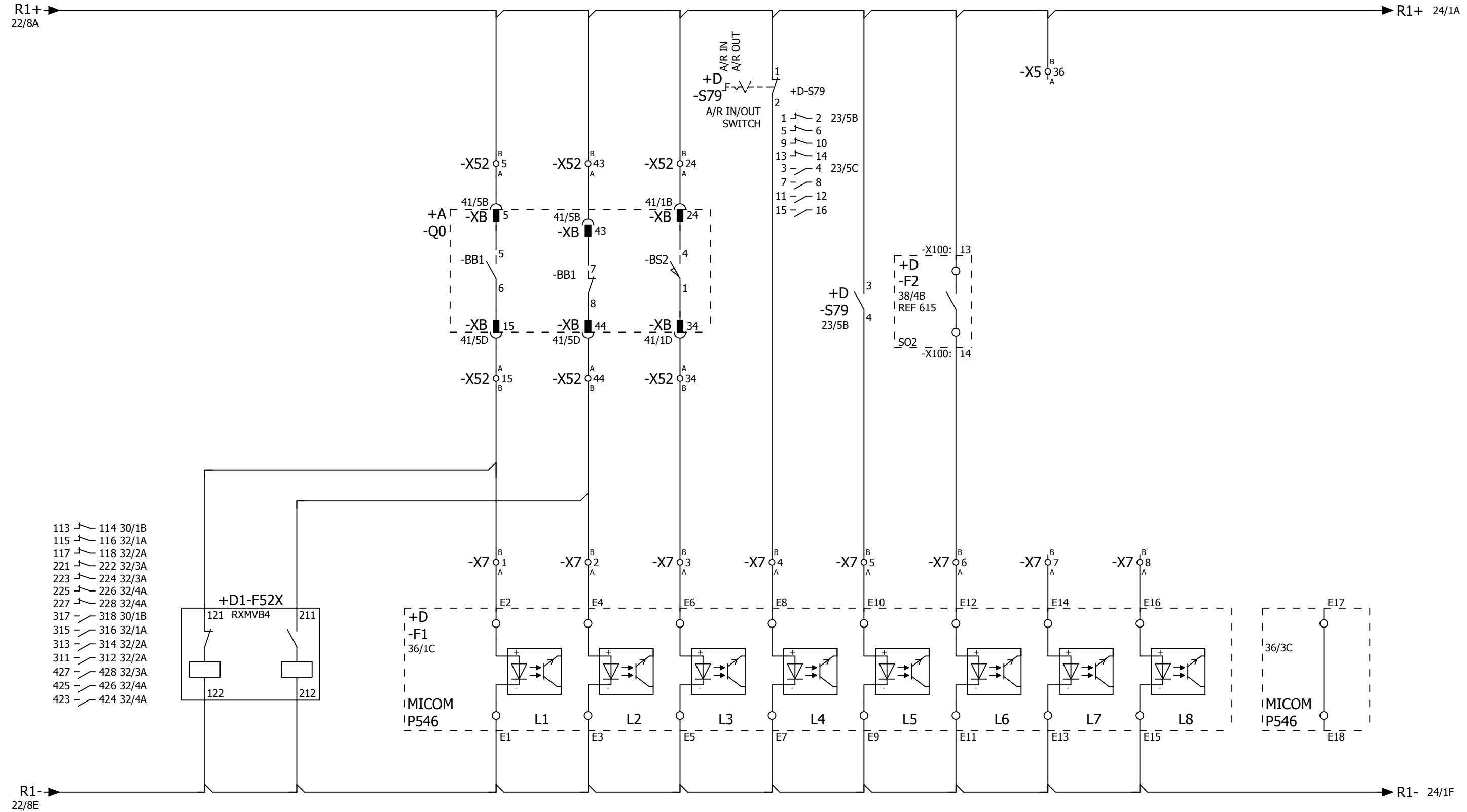
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Checked	Tariq	Approved	S.Moin
Project name		132/33kV # S/S-8501 ZS3.2	


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ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

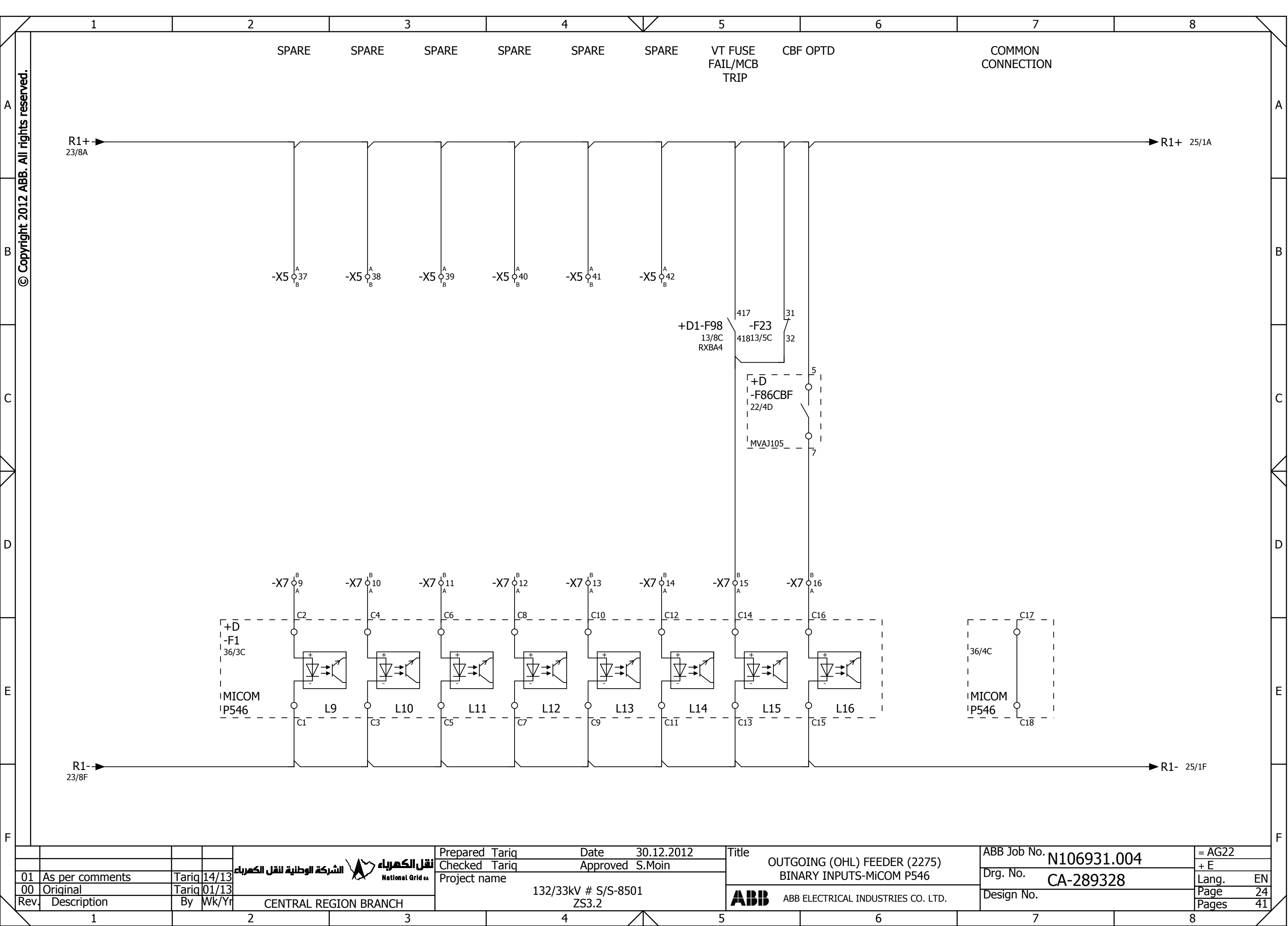
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Drq. No.	CA-289328	+ E
Design No.		Lang. EN
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		Pages 41

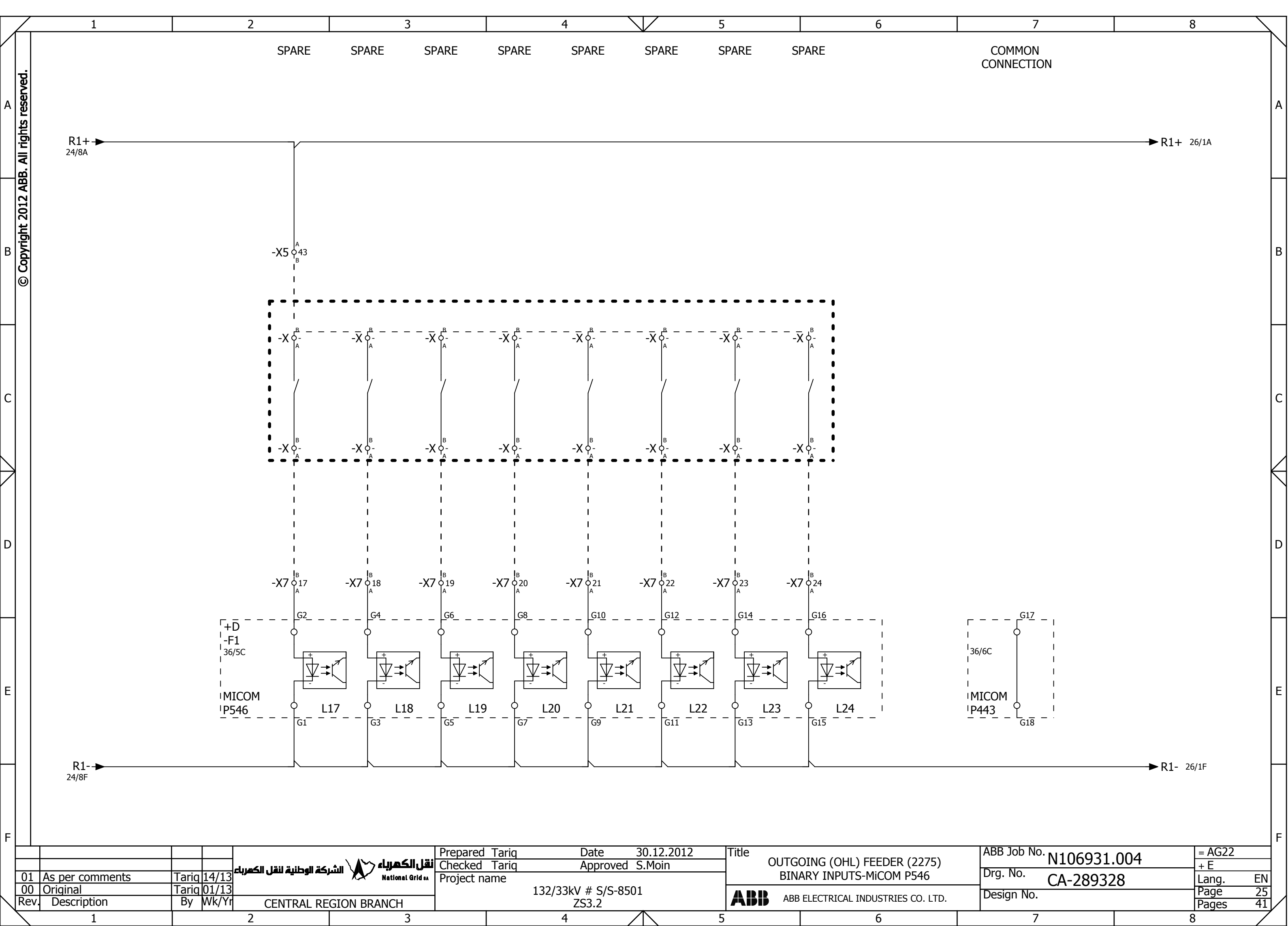
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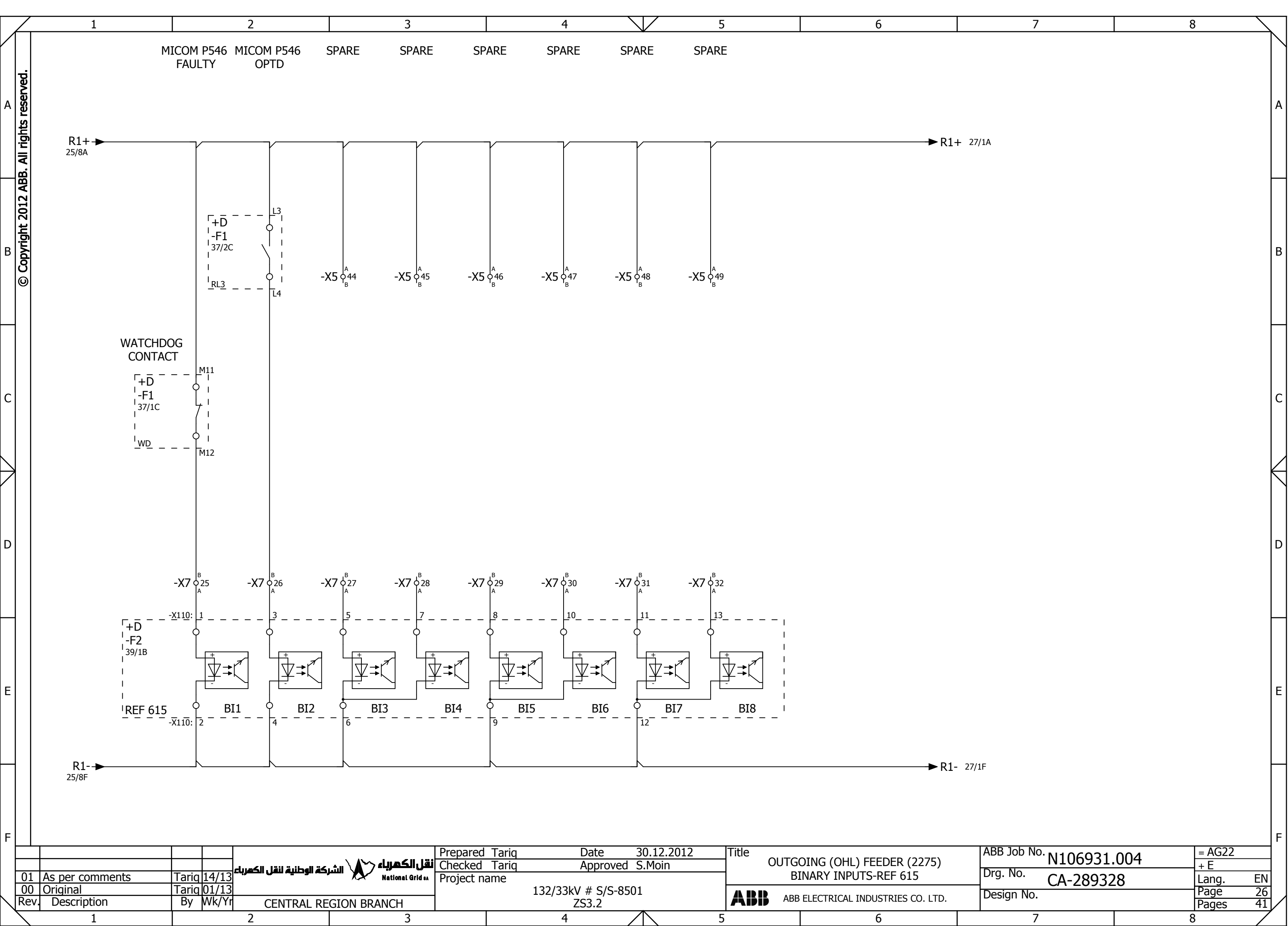
CB 'ON' CB 'OFF' CB SPRING CHARGED A/R IN A/R OUT A/R START 50/51 SPARE SPARE COMMON CONNECTION



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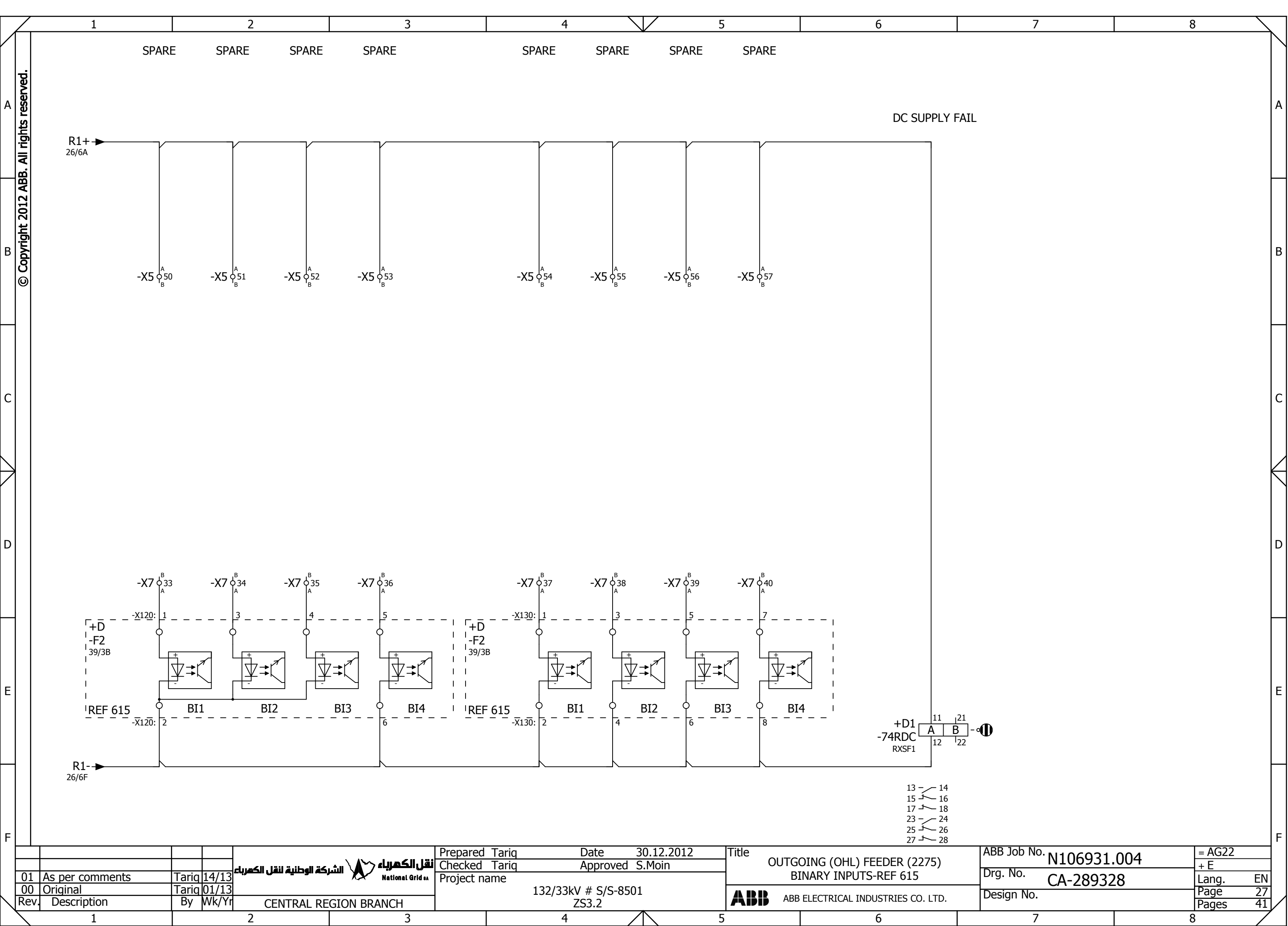
الشركة الوطنية لنقل الكهرباء
National Grid sa

CENTRAL REGION BRANCH

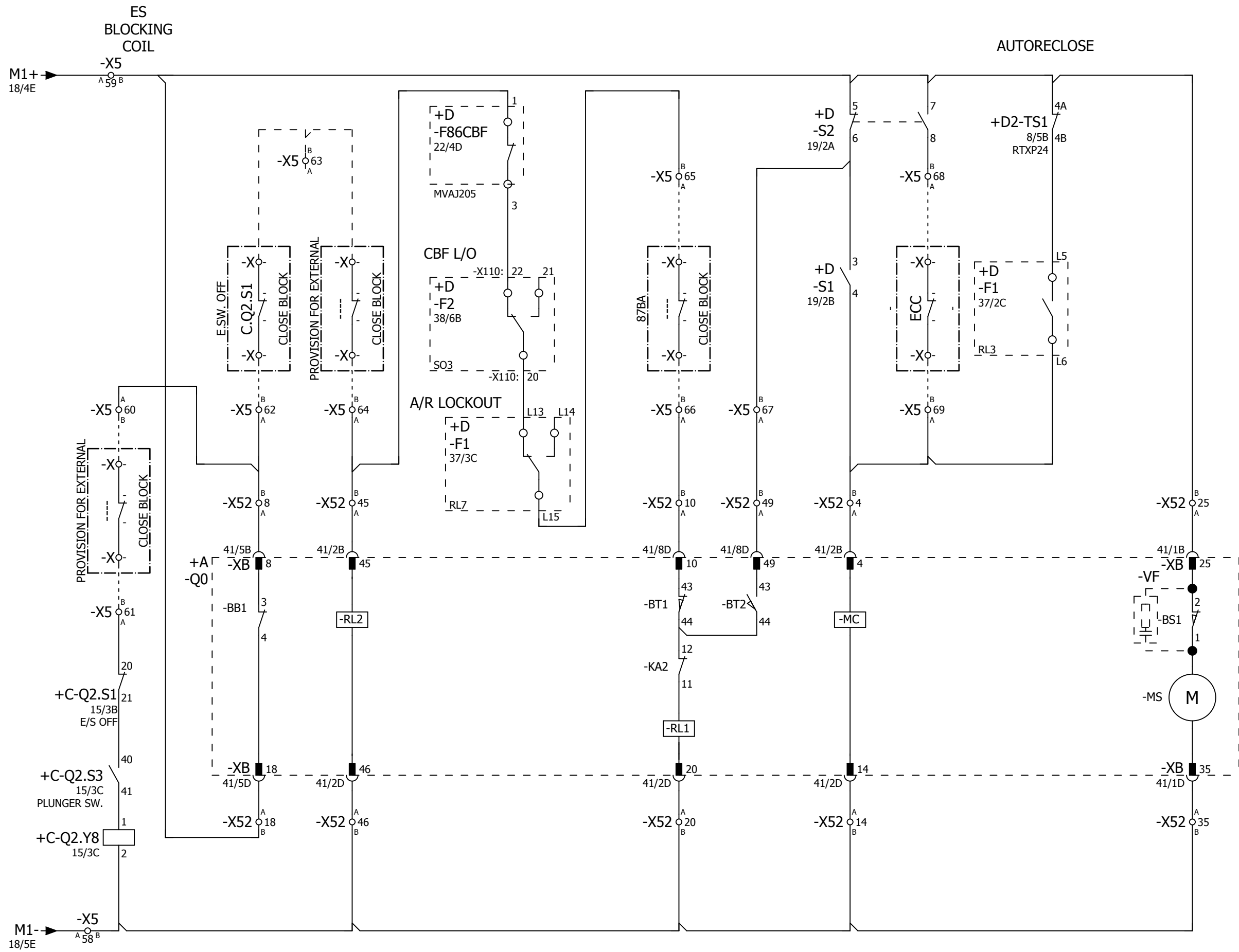
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Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (2275) BINARY INPUTS-REF 615
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG22
Drg. No.	CA-289328	+ E
Design No.		Lang. EN
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		Pages 41



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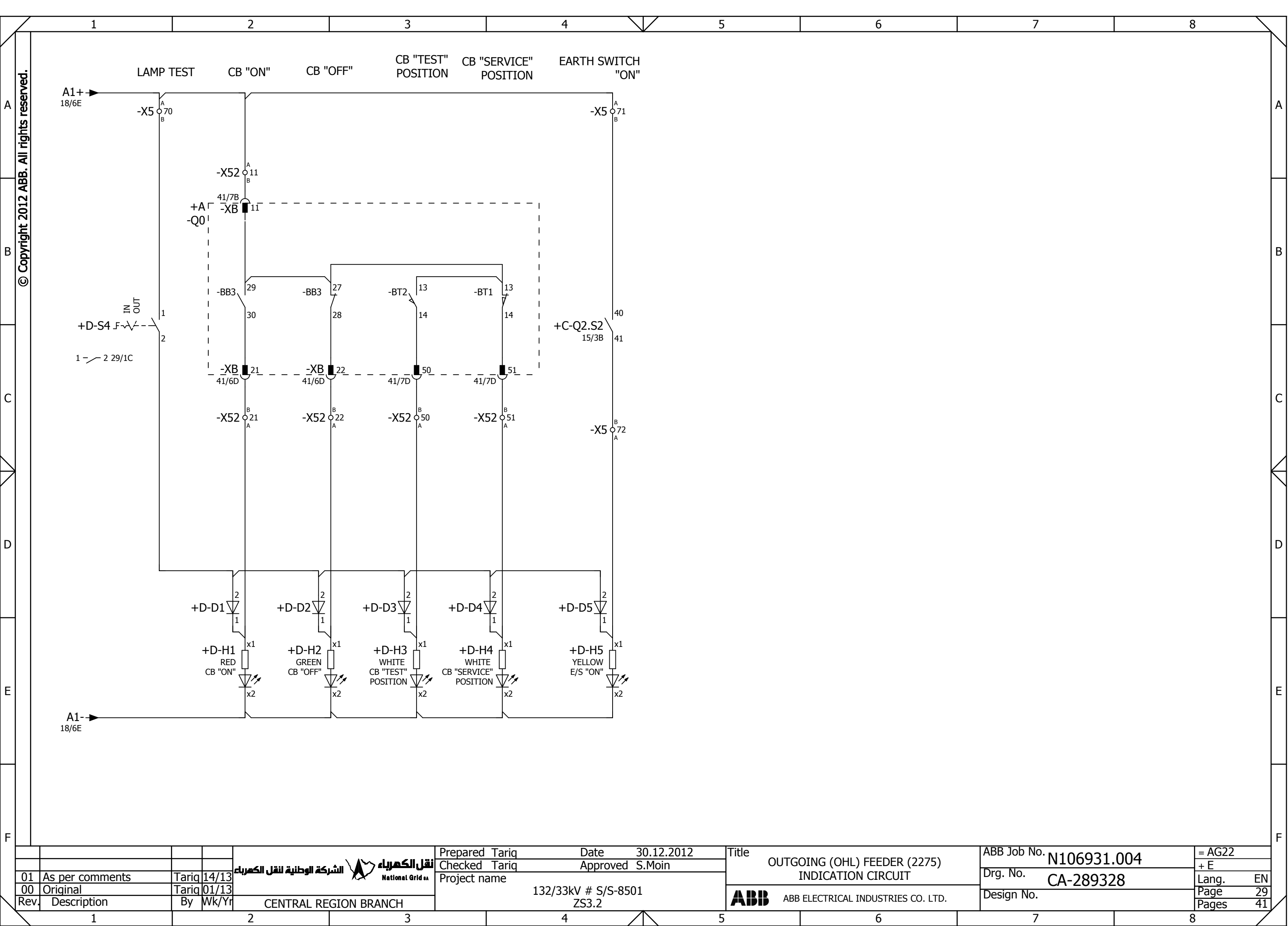
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Rev.	Description	By	Wk/Yr

الشركة الوطنية لنقل الكهرباء
National Grid SA
CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (2275) CLOSING CIRCUIT/CB SPRING CHARGE MOTOR
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG22
Drg. No.	CA-289328	+ E
Design No.		Lang. EN
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		Pages 41



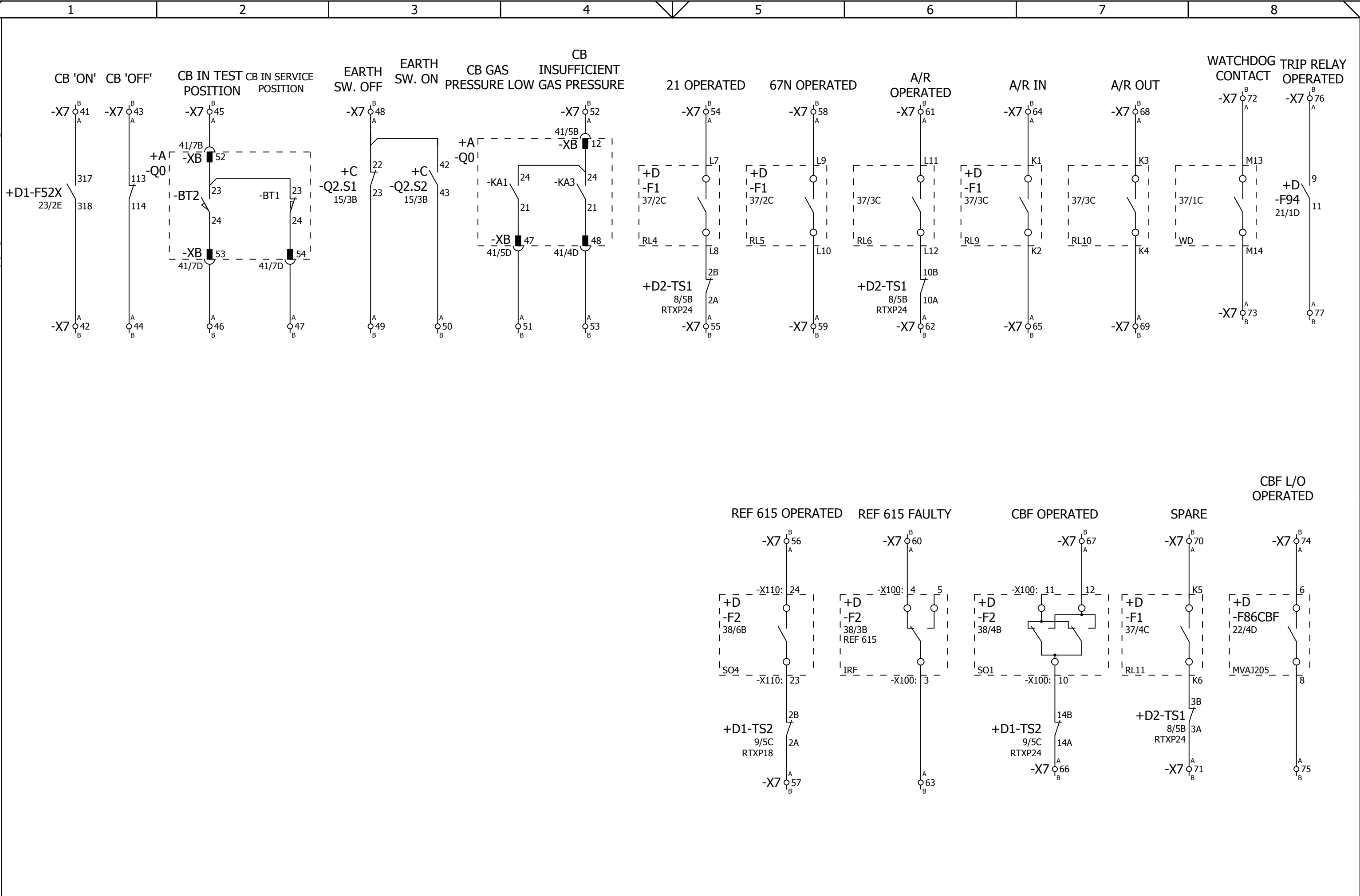
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00	Original	Tariq	01/13	
Rev.	Description	By	Wk/Yr	

CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name 132/33kV # S/S-8501 ZS3.2	

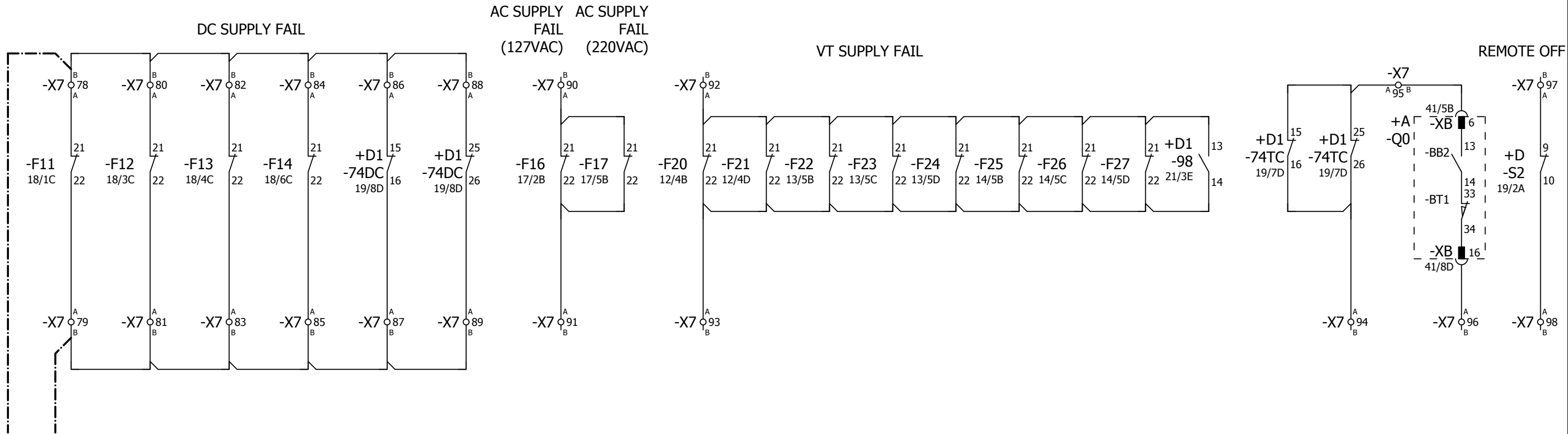
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Drg. No.	CA-289328	+ E
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		Page 29
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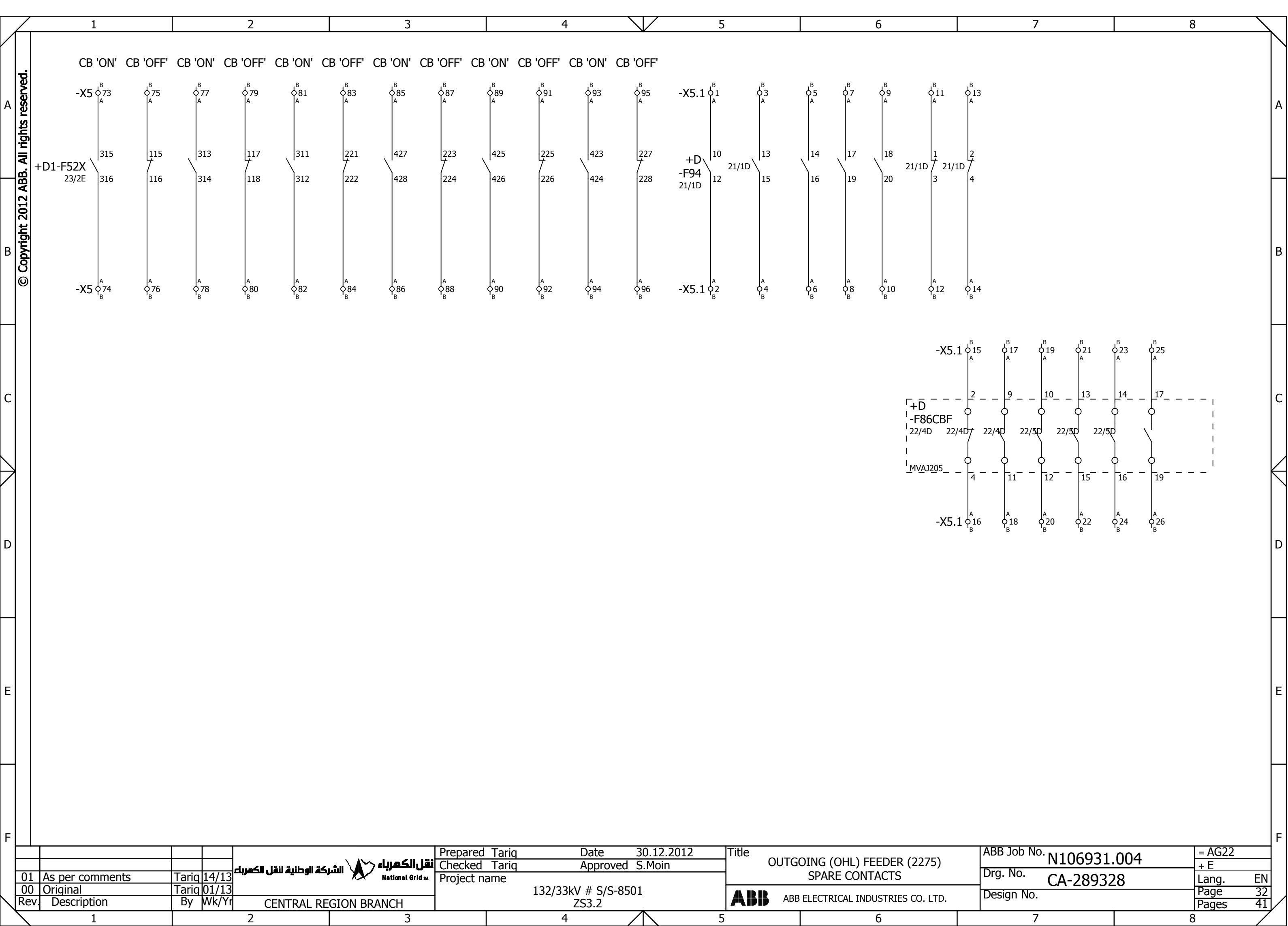


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00	Original	Tariq	01/13					Page 31
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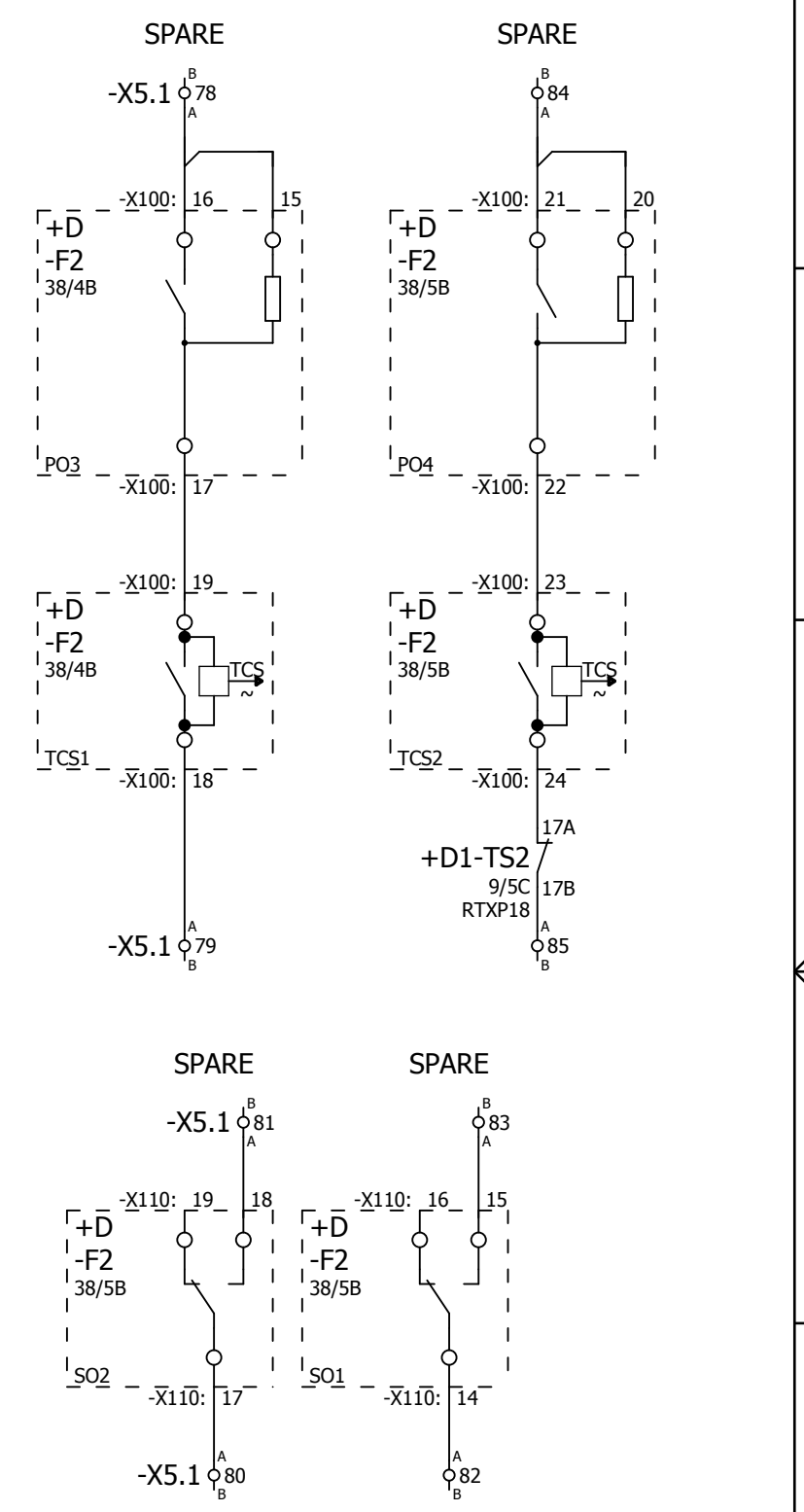
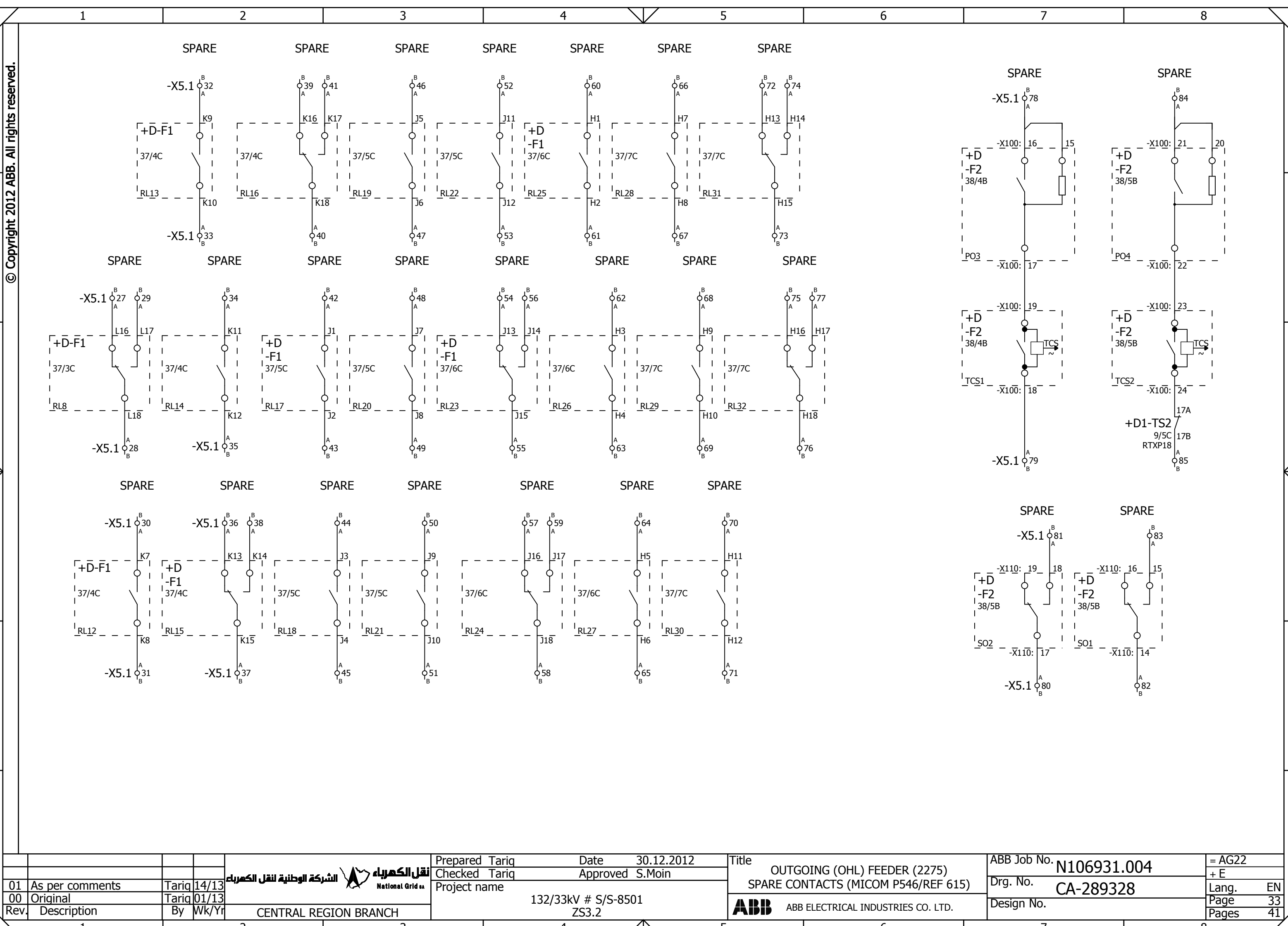
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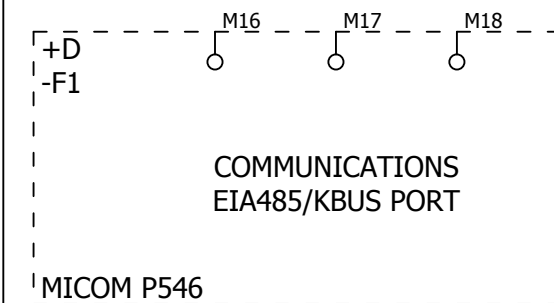
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00	Original	Tariq	01/13									
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											Pages 41	



MiCOM P546

MiCOM P546

				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING (OHL) FEEDER (2275) MiCOM P546 - DIGITAL INPUTS	ABB Job No.	N106931.004	= AG22
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MiCOM P546

+D-F1

MiCOM P546 : MULTIFUNCTION LINE DIFFERENTIAL RELAY

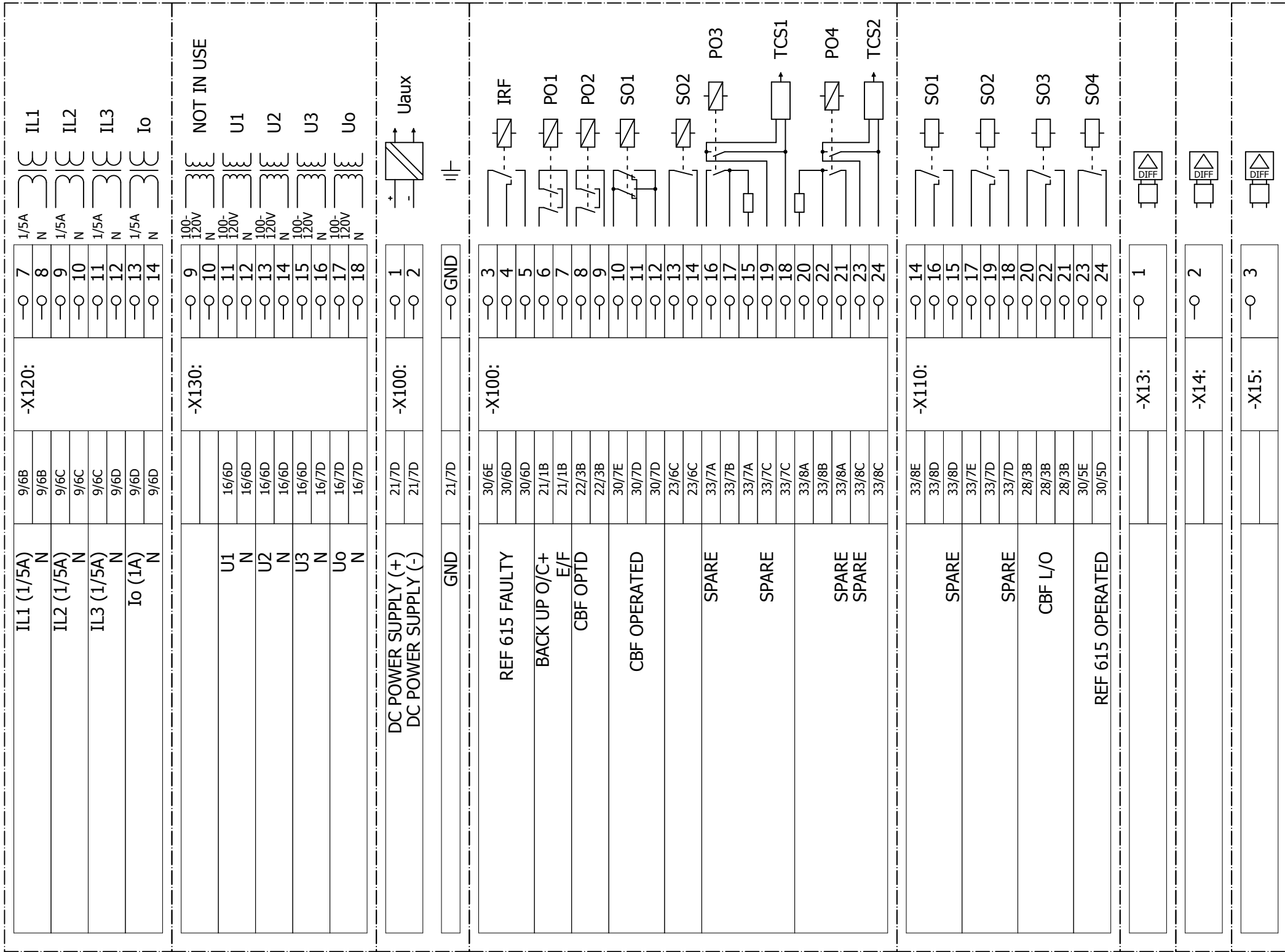
WATCHDOG CONTACT	26/2C 26/2C	30/8B 30/8B	WATCHDOG CONTACT	WATCHDOG CONTACT	—O M11 —O M12 —O M13 —O M14
WATCHDOG CONTACT					
WATCHDOG CONTACT					
21, 67N, 50/51,50N/51N	21/2B 21/2B				RL1
TO REF 615	26/2B 26/2B				RL2
AUTORECLOSE	28/6B 28/6B				RL3
21 OPERATED	30/5B 30/5B				RL4
67N OPERATED	30/5B 30/5B				RL5
A/R OPERATED	30/5B 30/6B 30/6B				RL6
A/R LOCKOUT	28/3C 28/4C 28/3C				RL7
SPARE	33/1C 33/1C 33/1C				RL8
A/R IN	30/7B 30/7B 30/7B				RL9
A/R OUT	30/7B 30/7B 30/7B				RL10
SPARE	30/8D 30/8E 33/1D				RL11
SPARE	33/1E 33/2A 33/2B				RL12
SPARE	33/2C 33/2C 33/2C				RL13
SPARE	33/2D 33/2D 33/2E				RL14
SPARE	33/2A 33/3A 33/2B				RL15
SPARE	33/2B 33/2B 33/2B				RL16
SPARE	33/3C 33/3C 33/3D				RL17
SPARE	33/3E 33/3E 33/3E				RL18
SPARE	33/3A 33/3B 33/3C				RL19
SPARE	33/3C 33/3C 33/3D				RL20
SPARE	33/3E 33/4A 33/4B				RL21
SPARE	33/4C 33/4C 33/4C				RL22
SPARE	33/4D 33/4D 33/4E				RL23
SPARE	33/4A 33/4B 33/4C				RL24
SPARE	33/4C 33/4C 33/4C				RL25
SPARE	33/4D 33/4E 33/5A				RL26
SPARE	33/5B 33/5C 33/5C				RL27
SPARE	33/5D 33/5E 33/5A				RL28
SPARE	33/5B 33/5C 33/6C				RL29
SPARE	33/5C 33/5C 33/5C				RL30
SPARE	33/5A 33/5B 33/5C				RL31
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MiCOM P546

+D-F2

REF 615

REF 615 : BACK UP O/C +E/F RELAY



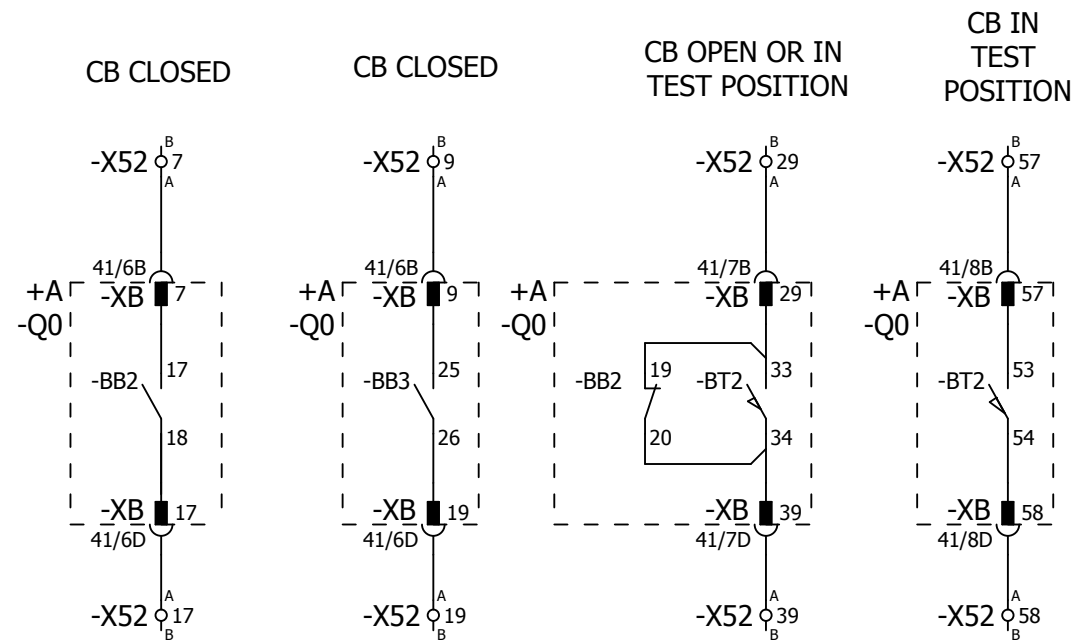
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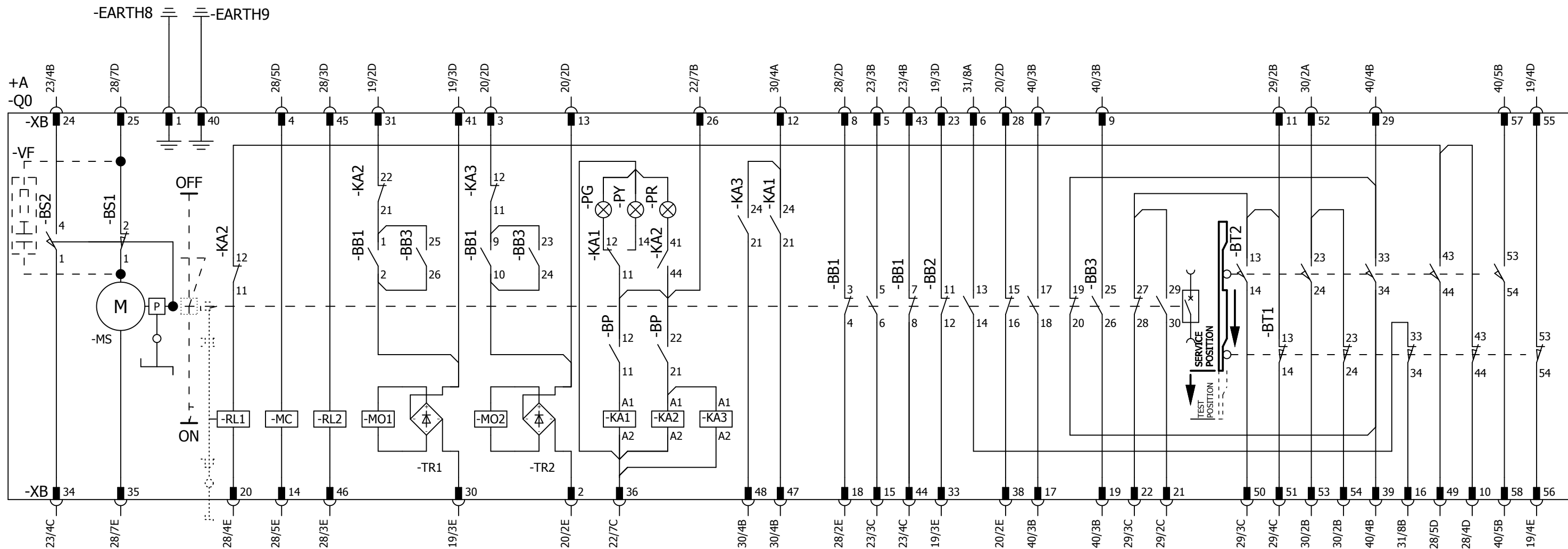
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00	Original	Tariq	01/13	132/33kV # S/S-8501		Design No.		Page 40
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				Pages 41

HD4

DOC. No: 1VCZ400054

Figures: 1, 2, 3, 4, 7, 9, 14, 22, 32, 51

CB OPEN, TRUCK IN SERVICE POSITION, SPRING NOT CHARGED



SPARE TERMINALS

-X2	33	34	35	36
-X3	12	13		
-X4	21	22	23	24
-X5.1	86	87	88	89
-X7	99			
-X7.1	1	2	3	4
-X11	15	16		
-X12	15	16		
-X13	21	22		
-X14	12	13		
-X52	40	42	47	48
-X87	9	10		

DESIGNAT.	FIGURE	DESCRIPTION	DESIGNAT.	FIGURE	DESCRIPTION
-MS	Fig.1	MOTOR FOR SPRING CHARGING	-PG	Fig.14	GREEN LED - NORMAL GAS PRESSURE
-BS1	Fig.1	CLOSING SPRINGS DISCHARGED	-PY	Fig.14	YELLOW LED - LOW GAS PRESSURE
-MC	Fig.2	SHUNT RELEASE ON	-PR	Fig.14	RED LED - INSUFFICIENT GAS PRESSURE
-RL1	Fig.3	BLOCKING MAGNET AGAINST CB CLOSING	-BS2	Fig.22	CLOSING SPRING CHARGED
-RL2	Fig.4	BLOCKING MAGNET AGAINST TRUCK MOVING			
-MO1	Fig.7	FIRST SHUNT RELEASE OFF	-BB1	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR1	Fig.7	RECTIFIER FOR COIL -MO1	-BB2	Fig.32	AUXILIARY SWITCH CB SHAFT
-MO2	Fig.9	SECOND SHUNT RELEASE OFF	-BB3	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR2	Fig.9	RECTIFIER FOR COIL -MO2	-BT1	Fig.51	CB TRUCK IN SERVICE (CONNECTED) POSITION
-KA1	Fig.14	AUX. RELAY - LOW GAS PRESSURE	-BT2	Fig.51	CB TRUCK IN TEST (ISOLATED) POSITION
-KA2	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XB		58-POLE PLUG FOR AUXILIARY CIRCUITS
-KA3	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XG		GROUND TERMINALS

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CA-289327

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C424

11131061/00

JOB ORDER / CONTRACT NO.

INDEX

PLANT NO.

DRAWING NUMBER

REV. NO.

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0409
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 800A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE	DRAWING NO.
XXXXX	XXXXX
XXXXX	XXXXX

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

AS-BUILT

BY

DATE

01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

نقل الكهرباء

الشركة الوطنية لنقل الكهرباء

National Grid

CENTRAL REGION BRANCH

DRAWN BY

Tariq

CHECKED BY

Tariq

SCALE

DATE STARTED

30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

THIS DRAWING IS NOT TO BE USED FOR
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MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED

BY

DATE

COVER SHEET

OUTGOING U/G CABLE FEEDER (2075)

132/33kV # S/S-8501

SAUDI ARABIA

ABB CUBICLE NO.	SEC CUBICLE NO.	EARTH SWITCH NO.				
= AG20						
ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289327	1 of 41	00

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

DRAWING NUMBER	SHEET NO.	REV. NO.
CA-289327	1 of 41	00

S:\SWG Projects DRGS\SEC-COA\N106931-04 SS-8170-8178-8833-8501\Detail Design\8501

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This typical is also valid for: AG20

SHEET INDEX

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=AG20+E/1	COVER SHEET	00	Original	01	As per comments				
=AG20+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG20+E/3	Apparatus List	00	Original	01	As per comments				
=AG20+E/4	Terminal Block Schedule	00	Original	01	As per comments				
=AG20+E/5	Single Line Diagram	00	Original	01	As per comments				
=AG20+E/6	Cubicle Assembly	00	Original	01	As per comments				
=AG20+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG20+E/8	CT CORE1-LINE DIFFERENTIAL PROTECTION	00	Original	01	As per comments				
=AG20+E/9	CT CORE2-BACKUP O/C+E/F PROTECTION	00	Original	01	As per comments				
=AG20+E/10	CT CORE3-METERING	00	Original	01	As per comments				
=AG20+E/11	CT CORE4-87B PROTECTION	00	Original	01	As per comments				
=AG20+E/12	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG20+E/13	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG20+E/14	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG20+E/15	ES - INTERNAL WIRING	00	Original	01	As per comments				
=AG20+E/16	BUS VT SUPPLY TO MICOM P546 / REF 615	00	Original	01	As per comments				
=AG20+E/17	AC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG20+E/18	DC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG20+E/19	TRIP CIRCUIT-1 & SUPERVISION	00	Original	01	As per comments				
=AG20+E/20	TRIP CIRCUIT-2 & SUPERVISION	00	Original	01	As per comments				
=AG20+E/21	TRIP RELAY	00	Original	01	As per comments				
=AG20+E/22	CBF STAGE-2 LOCKOUT RELAY	00	Original	01	As per comments				
=AG20+E/23	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG20+E/24	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG20+E/25	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG20+E/26	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG20+E/27	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG20+E/28	CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	00	Original	01	As per comments				
=AG20+E/29	INDICATION CIRCUIT	00	Original	01	As per comments				
=AG20+E/30	CONTACTS TO SCADA INDICATION	00	Original	01	As per comments				
=AG20+E/31	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG20+E/32	SPARE CONTACTS	00	Original	01	As per comments				
=AG20+E/33	SPARE CONTACTS (MICOM P546/REF 615)	00	Original	01	As per comments				
=AG20+E/34	MiCOM P546 - ANALOGUE INPUTS	00	Original	01	As per comments				
=AG20+E/35	MiCOM P546 - COMMUNICATION PORTS	00	Original	01	As per comments				
=AG20+E/36	MiCOM P546 - DIGITAL INPUTS	00	Original	01	As per comments				
=AG20+E/37	MiCOM P546 - OUTPUTS	00	Original	01	As per comments				
=AG20+E/38	REF615 - A/I + Binary I/O Board	00	Original	01	As per comments				
=AG20+E/39	REF615 BINARY INPUTS	00	Original	01	As per comments				
=AG20+E/40	HD4 SPARE CONTACTS	00	Original	01	As per comments				
=AG20+E/41	HD4 INTERNAL WIRING	00	Original	01	As per comments				

				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (2075) SHEET INDEX	ABB Job No.	N106931.004	= AG20
					Checked Tariq	Approved	S.Moin					+ E
1	As per comments	Tariq	14/13		Project name	132/33kV # S/S-8501 ZS3.2	ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289327	Lang.	EN
0	Original	Tariq	01/13									
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Item Number	Component number	Object description	Comp. Qty (CUn)				
+A-Q0	HD4-401225-125V	SF6 CB:HD4/Z40.12.25(FOR ZS3.2-125VDC	1	+C-Q2.Y8	GCE9401766P0107	BLOCKING MAGNET, 125VDC	1
+C-CT1-3	CT-N106931-33KVOHL	ABB EJP : TPU73.63 BIL:36/70/170kV, Frequency : 60Hz. Ambient temp: 40C Ith : 25kA (1 sec) IDYNAMIC/Peak :65kA (2.6 times the Ith as per IEC for 60hz). Thermal over current factor: 1.2 for single ratio Primary terminal silver plated. Secondary Reconnect able CORE 1- RATIO : 400-800/1A CLASS : 5P20 BURDEN : 22.5VA - 45VA Rct : 1 Ohm - 2 Ohms CORE 2- RATIO : 400-800/1A CLASS : 5P10 BURDEN : 15-30VA Rct : 1 Ohm - 2 Ohms CORE 3- RATIO : 400-800/1A CLASS : 0.2Fs5 BURDEN : 15-30VA CORE 4- RATIO : 2000/1A CLASS : PX Vkp : 350V Io : 30mA Rct : 5 Ohms	3	+D-D1	MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1
				+D1-98	MV RK 271 007-AN	RXSFI, 2 (2NO+1NC) HAND RESET FLAG	1
				+D1-F98	MV-RXBA4-120VAC	3PH. FUSE SUPERVISION RELAY: RXBA4	1
				+D1-F52X	MV RK 251 401-AP	BISTABLE RELAY, RXMVB 4 : RK 251 401-AP	1
				+D1-741-4	MV RS 702 290-AA	SPER1C1/E255:RS 702 290-AA -w/o LED-TCS	4
				+D1-74DC	MV RK 271 019-AN	RXSFI1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-74RDC	MV RK 271 019-AN	RXSFI1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-74TC	MV RK 271 019-AN	RXSFI1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-TS1	MV RK 926 315-AG	TEST SWITCH, TYPE:RTXP24 (RK 926 315-AG)	1
				+D1-TS2	MV RK 926 115-BF	RELAY TEST SWITCH: RTXP18:RK 926 115-B	2
				+D1-TS87B	MV RK 926 002-AD	RTXP8	1
				+D-CVI	1YAB010028R0105	CVI(VOIS)36/40.5kV COMPLET W. INSULATORS	1
				+D-F1	P54631NK6M0710M	P546-Current Differential with Distance	1
				+D-F2	HBFJAEAGNEA1BAA1XE	REF615 -4I+5U-16BI+10BO+IEC61850	1
				+D-F86CBF	MV-MVAJ105RA0802	Lockout Relay for CBF stage-2(8 NO + 2 NC)	1
				+D-F94	MV-MVAJ101-RA-0802	MVAJ101 , (8 NO + 2 NC)	1
				+D-H1	LED-125V-RESIOD-R	LED48 -125VDC, Resist+Diode22 DIA, RED	1
				+D-H2	LED-125V-RESIOD-G	LED48 -125VDC, Resist+Diode22DIA, GREEN	1
				+D-H3-4	LED-125V-RESIOD-W	LED48-125VDC, Resist+Diode 22 DIA,WHITE	2
				+D-H5	LED-125V-RESIOD-Y	LED48-125VDC, Resistor+Diode,22D,YELLOW	1
				+D-P1	MV-V96LI-110-33KV	VOLTMETER, Type: V96LI-VT-A, 33000/110KV	1
				+D-P2	MV-A96LI-1A-800-DS	AMMETER, Type : A96LI-CT-A, 800-400/1A	1
				+D-P3	MV-M96D-1A-800-DS	MDI(built-in CT)Type: M96D_30,800-400/1A	1
				+D-S1	CA10-A216-FUAP530	CB OPEN-NORMAL-CLOSE-Padlock.red handle	1
				+D-S2	CA10-A223-FUAP531	BREAKER MODE SW. LOC/REM 20A 4P 2Positn	1
				+D-S3	CA10-A260-FUAP534	Space heater SW "Off-Auto-Manual" (K&N)	1
				+D-S4	CA10-A204-FUAP535	Lamp Test Switch (K&N)	1
				+D-S5	CA10-A007-VMTR	Voltmeter Sel. Switch (K&N)	1
				+D-S6	CHR10-A038-AMTR	Ammeter Selector Switch (K&N)	1
				+D-S79	CA10-A223-FUAP572	A/R IN-OUT SEL. SWITCH (K&N)	1
				+D-S86	MV-1SFA616100R4076	PB Black 1NO+1NC-22 dia-1SFA611100R4076	1
				+D-TSM	MV-129A514G01	FT-1 SW-FOR METERING CT/VT ISOL.(6C+4P)	1
				+E-E2	DMS 3110	THERMOSTAT 24,48,60,115 & 230V	1
				+E-E4	MV 5911 0818-01	FLUORESCENT LAMP WITH DIFFUSER, 120VAC	2
				+E-EC	GCE0990162P0101	PANEL HEATER 240V,50W-Boxin-3Met.Cable	1
				+E-F11-15	MV-S 282 UC-K6	MCB 6A DC -2P	5
				+E-F16-17	MV-S 202-K6	MCB 2 POLE 6A -AC	2
				+E-F20-21	MV-S 203-K10	MCB 3 Pole 10 Amp.	2
				+E-F22-27	MV-S 203-K4	MCB -3POLE-4A -AC	6
					MV-S2C-H11L	.Ux contact 1NO+1NC AC -MCB	2
					MV-S2-H11	Aux contact for DC MCB 1No+1NC	5
					MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1
					DMS 924 0004	COMBIFLEX TERMINAL BASE RX 2H (4U 6C)	1
					DMS 924 0002	COMBIFLEX TERMINAL BASE RX4 (4U 12C)	1

+C-VT1,2,3	TJP7-N106931-VT	TYPE : TJP7.1 AS PER LATEST IEC STD. SPECS. Ambient Temp: 40C BIL : 36/70/170kV FREQUENCY : 60Hz PRIMARY VOLTAGE : 33000/1.732V SECONDARY VOLTAGE1 WINDING : 110/1.732V BURDEN : 25VA CLASS : 0.2/3P SECONDARY VOLTAGE2 WINDING : 110/1.732V BURDEN : 25VA CLASS : 0.2/3P VOLTAGE RATING FACTOR : 1.9xUn for 8HOURS :1.2 x Un CONTINUOUS	3
+C-VTF1,2,3	AE4754-2000-02	VT pri FUSE ZS3.2-36KV2A type17CAV,440MM	3
+C-EC	AE5858-2004-AB	SPACE HEATER 220V AC, 150-200W	1
+C-Q2	GCE7005552R0101	EARTH SWITCH-EK6, 36KV, 31.5KA	1

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TERMINALS

NAME	TYPE	REMARK	QUANTITY	FUNCTION
X3	USST4		13	CONTROL CIRCUIT
X4	USST4		25	CONTROL CIRCUIT
X5	USST4		96	CONTROL CIRCUIT
X5.1	USST4		99	CONTROL CIRCUIT
X7	WTR-4SL		99	SCADA CIRCUIT
X7.1	WTR-4SL		9	SCADA CIRCUIT
X11	OTTA6-T-P/P		16	CT CIRCUIT
X12	OTTA6-T-P/P		16	CT CIRCUIT
X13	OTTA6-T-P/P		22	CT CIRCUIT
X14	OTTA6-T-P/P		13	CT CIRCUIT
X52	USST4		53	CB CIRCUIT
X87	OTTA6-T-P/P		10	CT CIRCUIT
X2	WTL6SL		36	VT CIRCUIT

				Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) Terminal Block Schedule	ABB Job No.	N106931.004	= AG20	
				Checked Tariq	Approved S.Moin		Drg. No.	CA-289327	+ E	
01	As per comments	Tariq	14/13	Project name			Design No.		Lang. EN	
00	Original	Tariq	01/13	132/33kV # S/S-8501					Page	4
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National Grid SA

Prepared Tariq

Date 30.12.2012

Checked Tariq

Approved S.Moin

Project name

132/33kV # S/S-8501

ZS3.2

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

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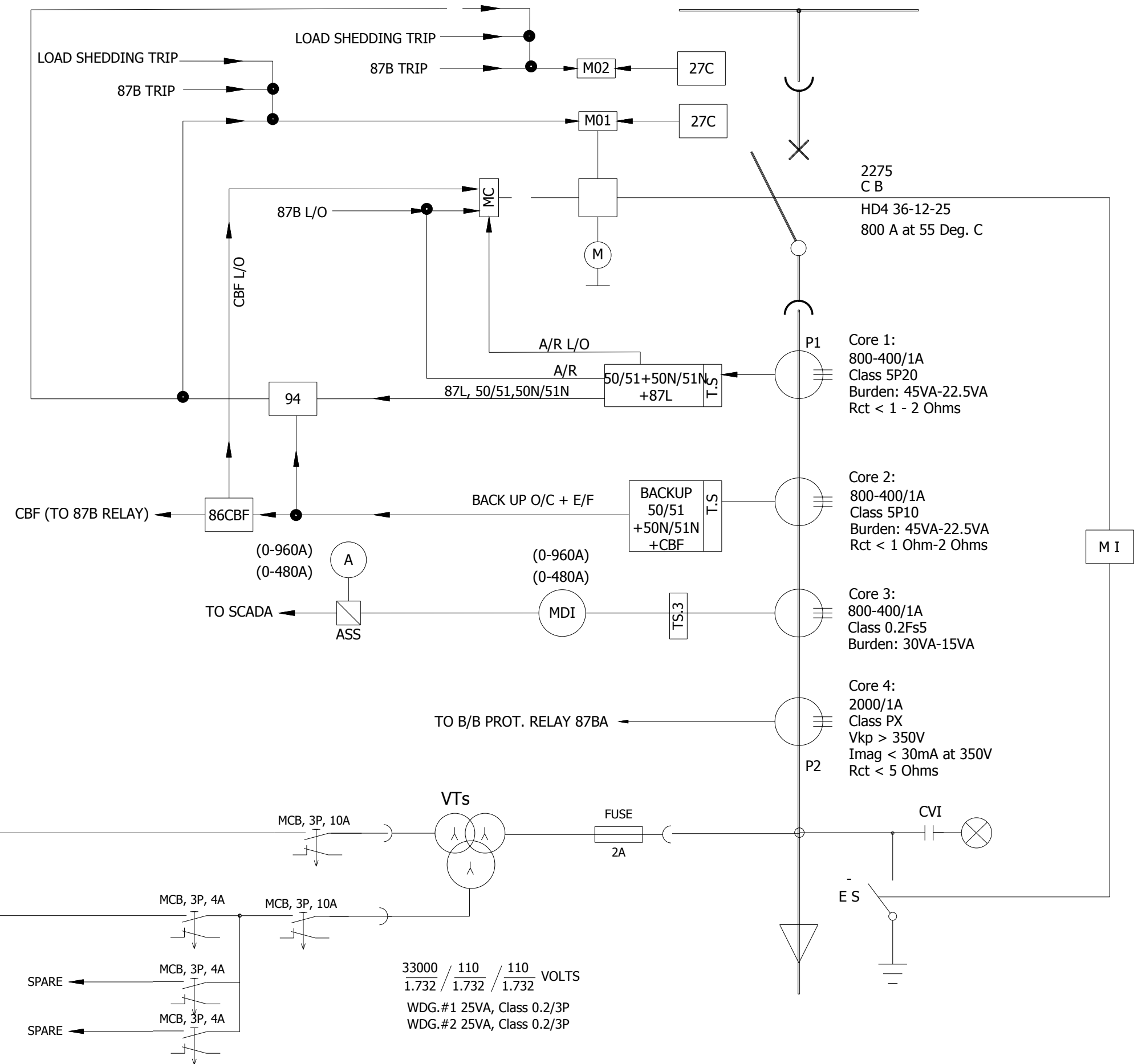
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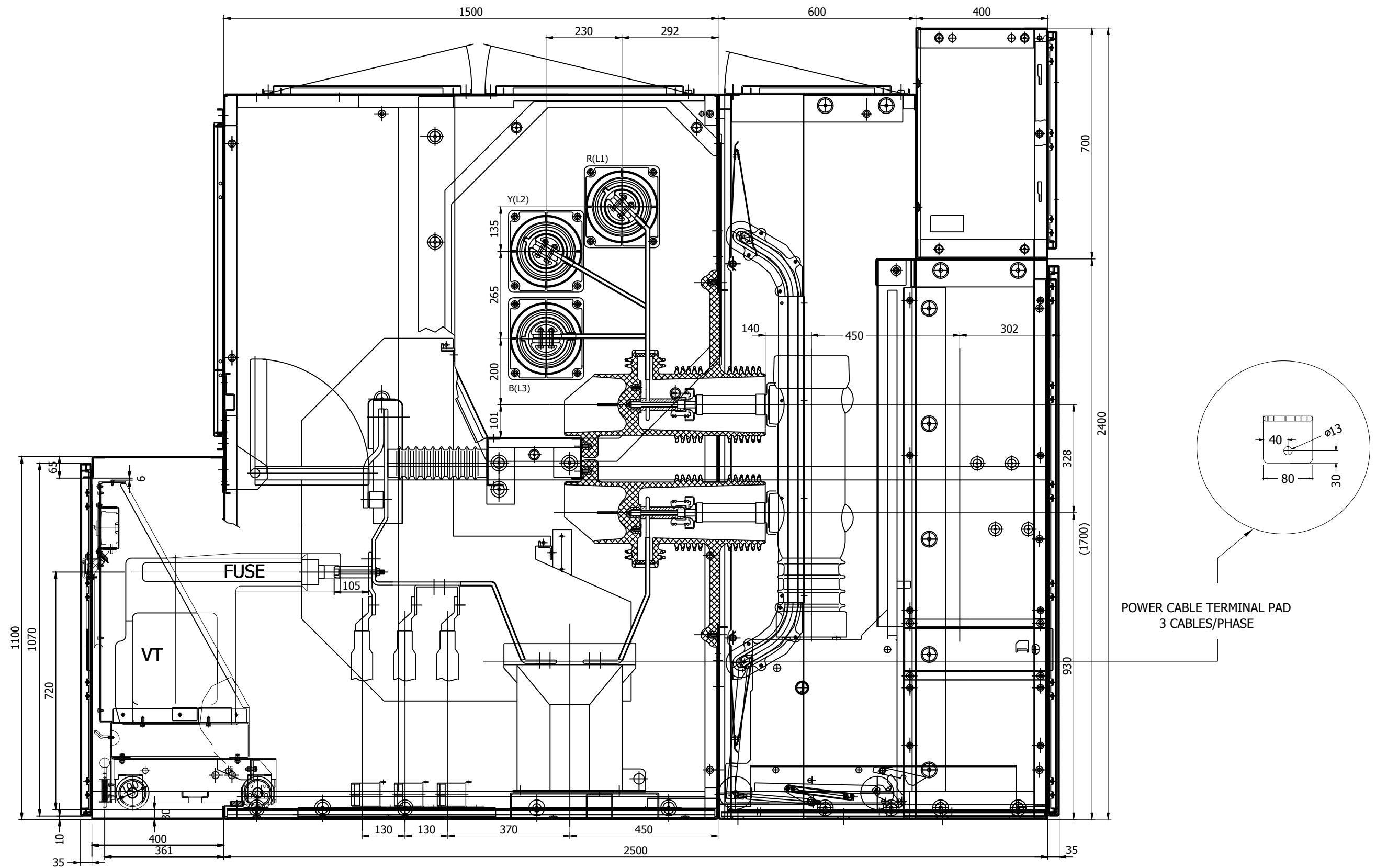
8

50/51 - Line Differential protection relay, Type: MICOM P546
+50N/51N
+87L

- Ⓜ - CB charging motor



				<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>الشركة الوطنية لنقل الكهرباء</div><div>National Grid SA</div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (2075) Single Line Diagram	ABB Job No. N106931.004	= AG20 + E
					Checked Tariq	Approved	S.Moin				
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2						
00	Original	Tariq	01/13					Design No.	Page 5	Pages 41	
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00	Original	Tariq	01/13
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الشركة الوطنية لنقل الكهرباء
National Grid sa
CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING U/G CABLE FEEDER (2075) Cubicle Assembly
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG20
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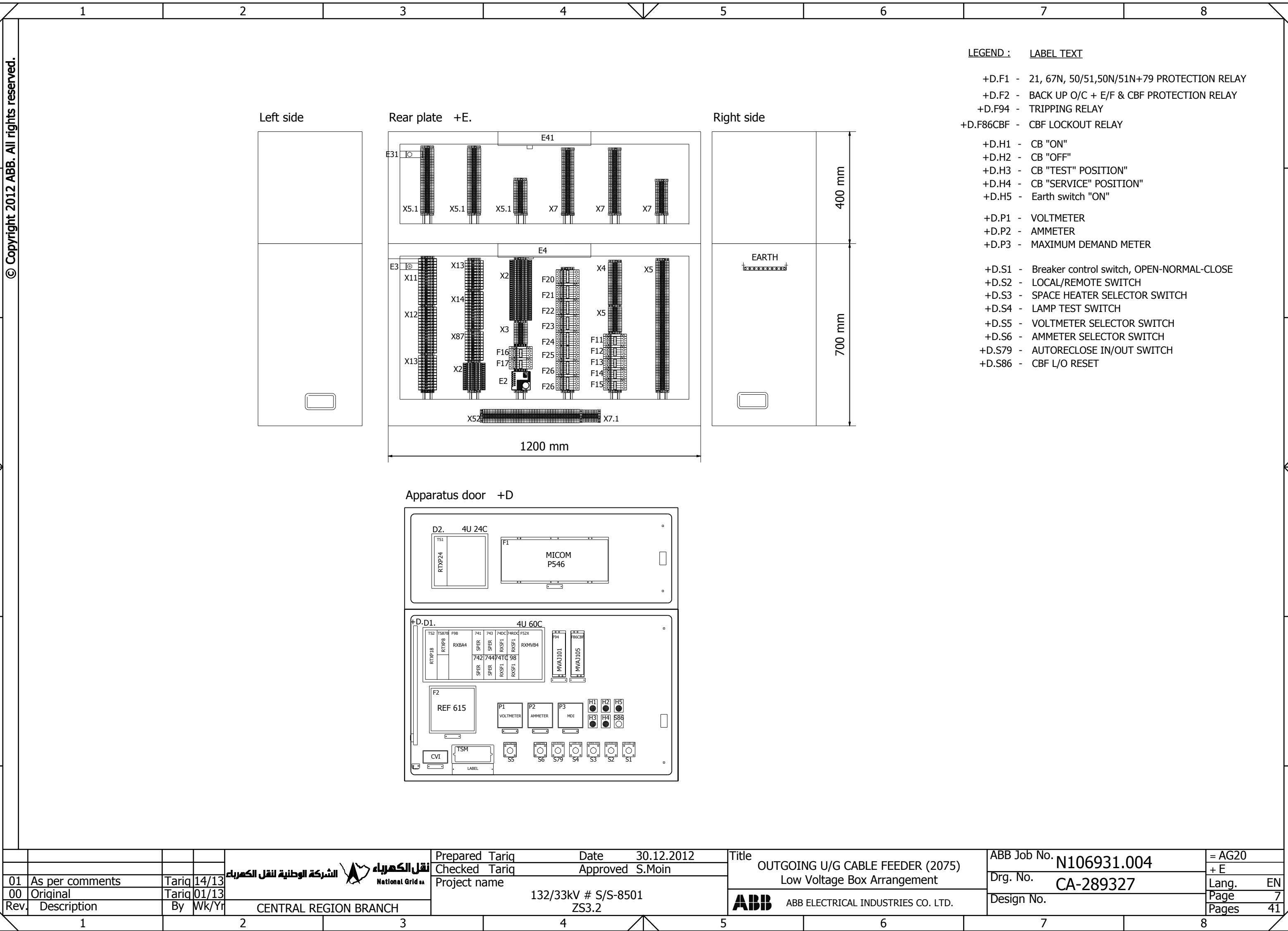
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LEGEND :

LABEL TEXT

+D.F1 - 21, 67N, 50/51,50N/51N+79 PROTECTION RELAY

+D.F2 - BACK UP O/C + E/F & CBF PROTECTION RELAY

+D.F94 - TRIPPING RELAY

+D.F86CBF - CBF LOCKOUT RELAY

+D.H1 - CB "ON"

+D.H2 - CB "OFF"

+D.H3 - CB "TEST" POSITION"

+D.H4 - CB "SERVICE" POSITION"

+D.H5 - Earth switch "ON"

+D.P1 - VOLTMETER

+D.P2 - AMMETER

+D.P3 - MAXIMUM DEMAND METER

+D.S1 - Breaker control switch, OPEN-NORMAL-CLOSE

+D.S2 - LOCAL/REMOTE SWITCH

+D.S3 - SPACE HEATER SELECTOR SWITCH

+D.S4 - LAMP TEST SWITCH

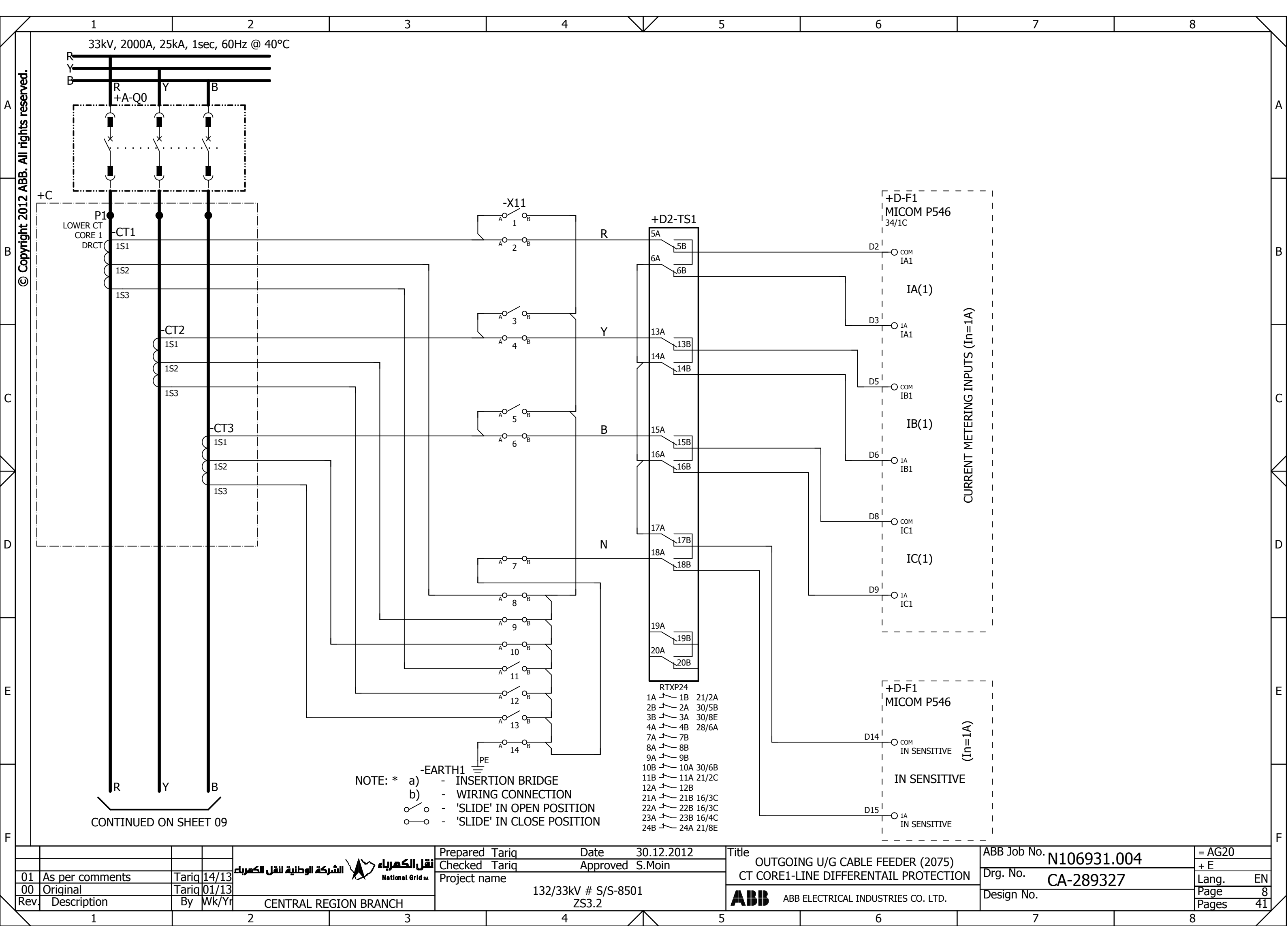
+D.S5 - VOLTMETER SELECTOR SWITCH

+D.S6 - AMMETER SELECTOR SWITCH

+D.S79 - AUTORECLOSE IN/OUT SWITCH

+D.S86 - CBF L/O RESET

				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG20
				Checked Tariq	Approved S.Moin	OUTGOING U/G CABLE FEEDER (2075)	N106931.004	+ E
01	As per comments	Tariq	14/13	Project name		Low Voltage Box Arrangement	Drg. No.	Lang. EN
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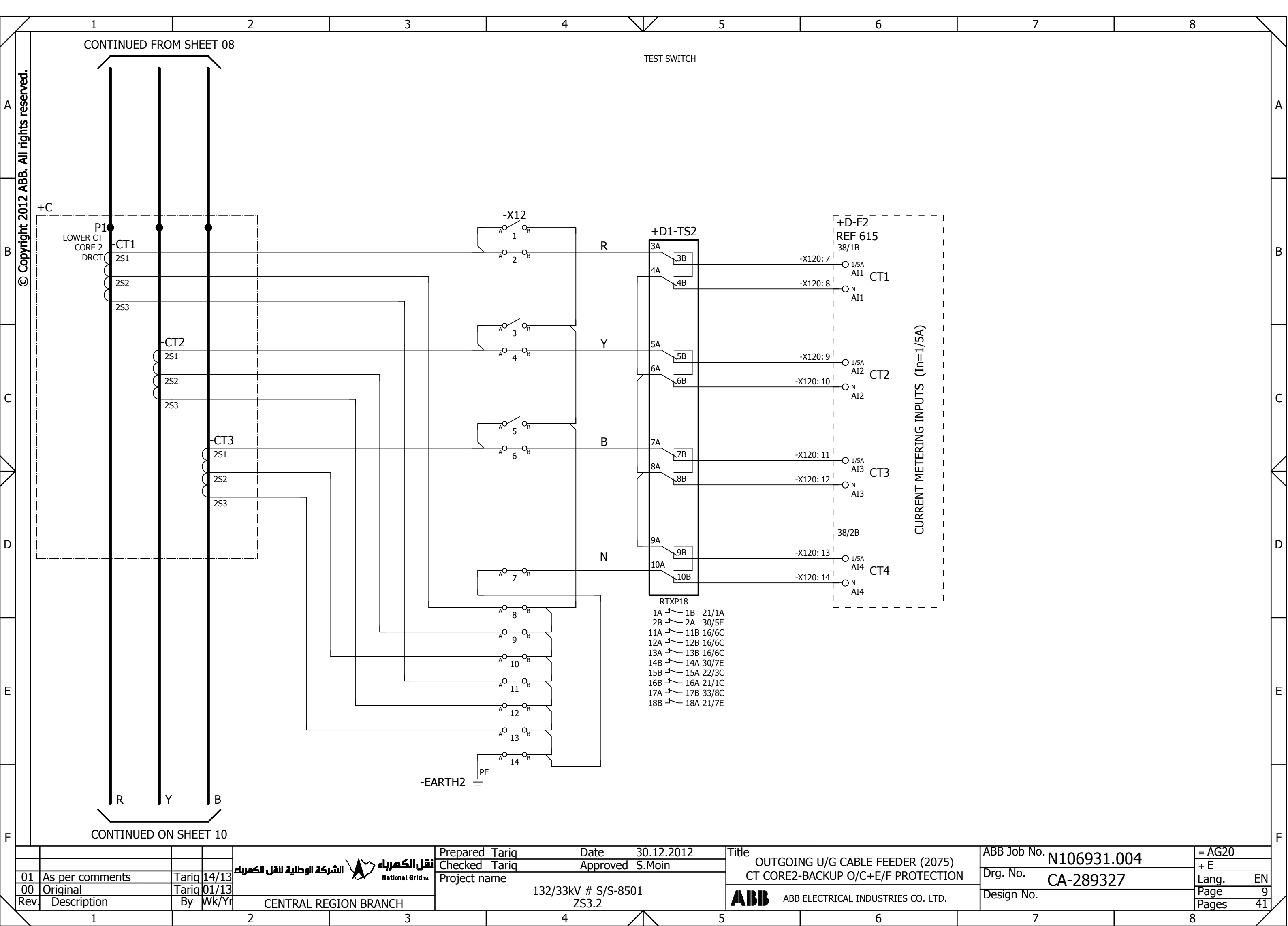
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			CENTRAL REGION BRANCH


Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING U/G CABLE FEEDER (2075) CT CORE1-LINE DIFFERENTIAL PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

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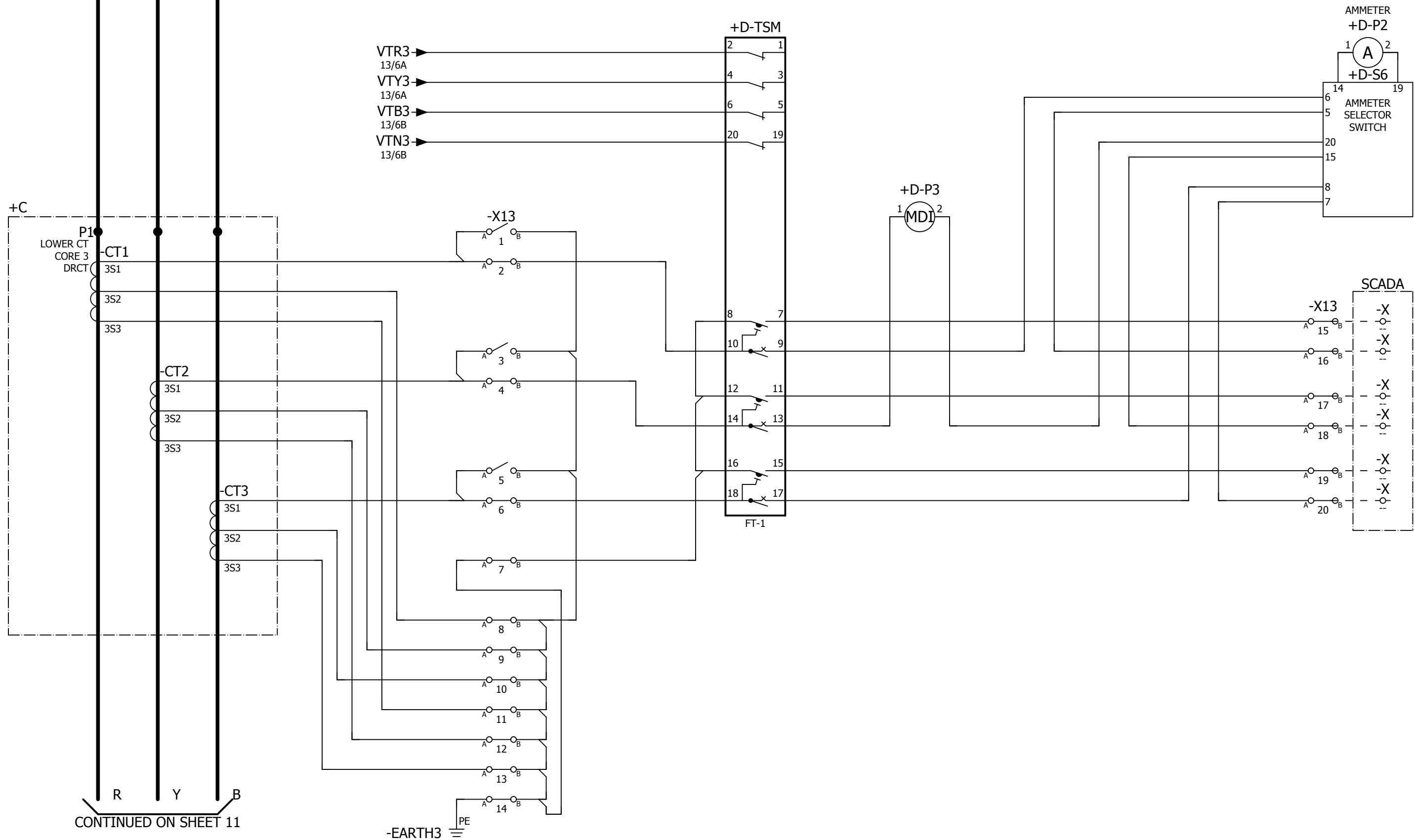
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00	Original	Tariq	01/13		
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Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name 132/33kV # S/S-8501 ZS3.2	

Title	OUTGOING U/G CABLE FEEDER (2075) CT CORE2-BACKUP O/C+E/F PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

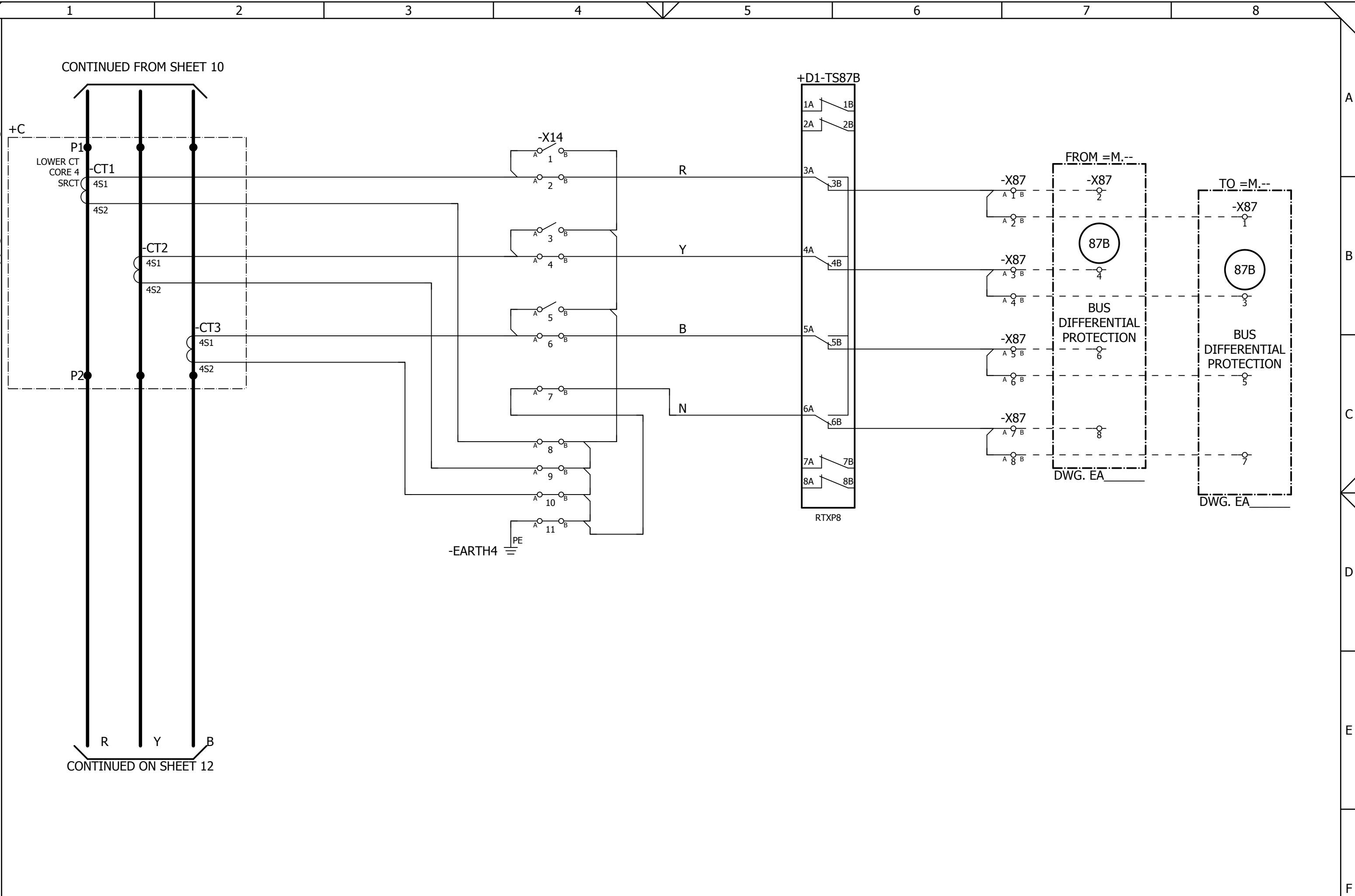
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) CT CORE3-METERING	ABB Job No.	N106931.004	= AG20	
					Checked Tariq	Approved S.Moin			Drg. No.	CA-289327	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			<div>ABB</div> ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Lang. EN	
00	Original	Tariq	01/13								
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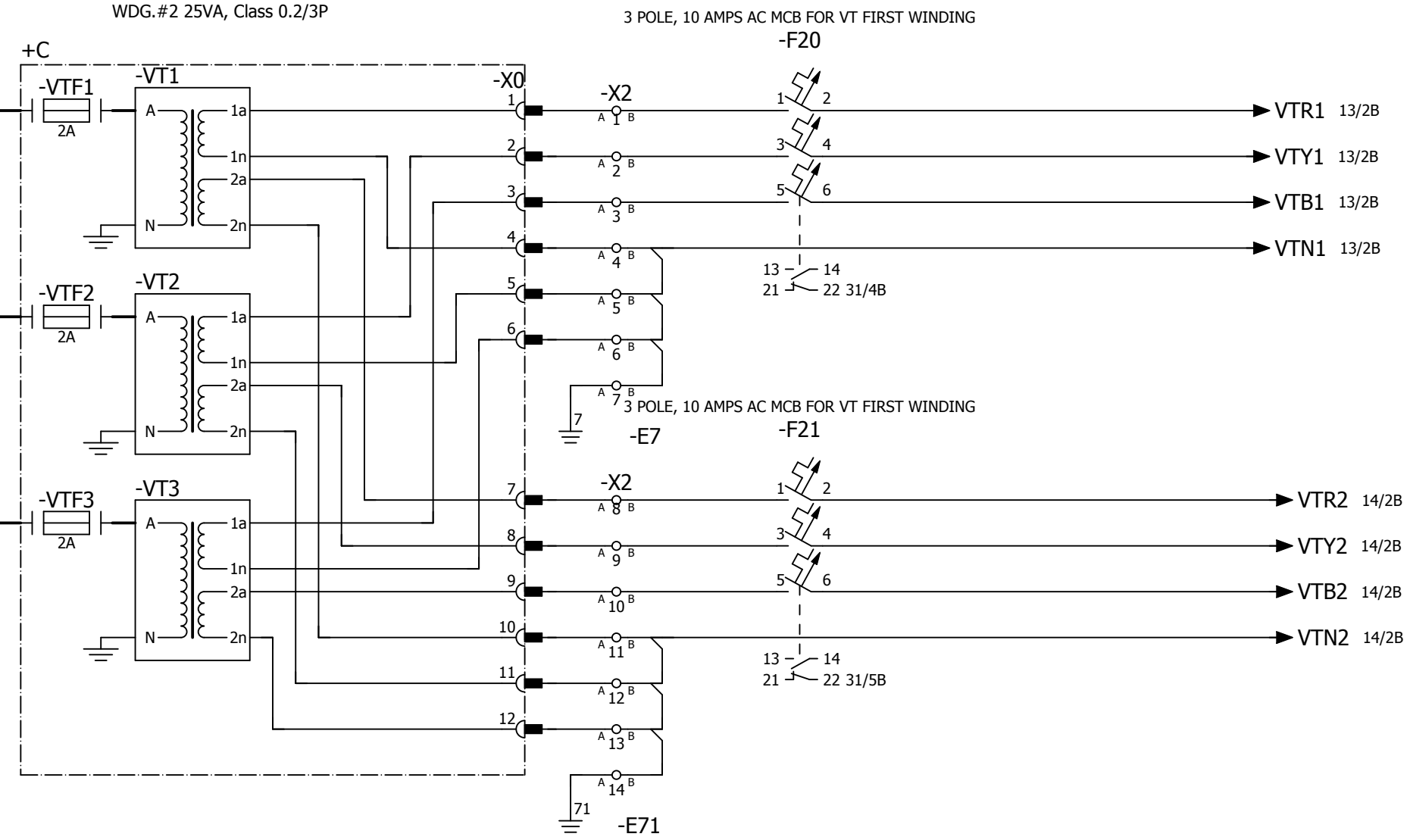
				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) CT CORE4-87B PROTECTION <div>ABB</div> ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No. N106931.004	= AG20	
					Checked Tariq	Approved S.Moin			Drg. No. CA-289327	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Lang. EN	
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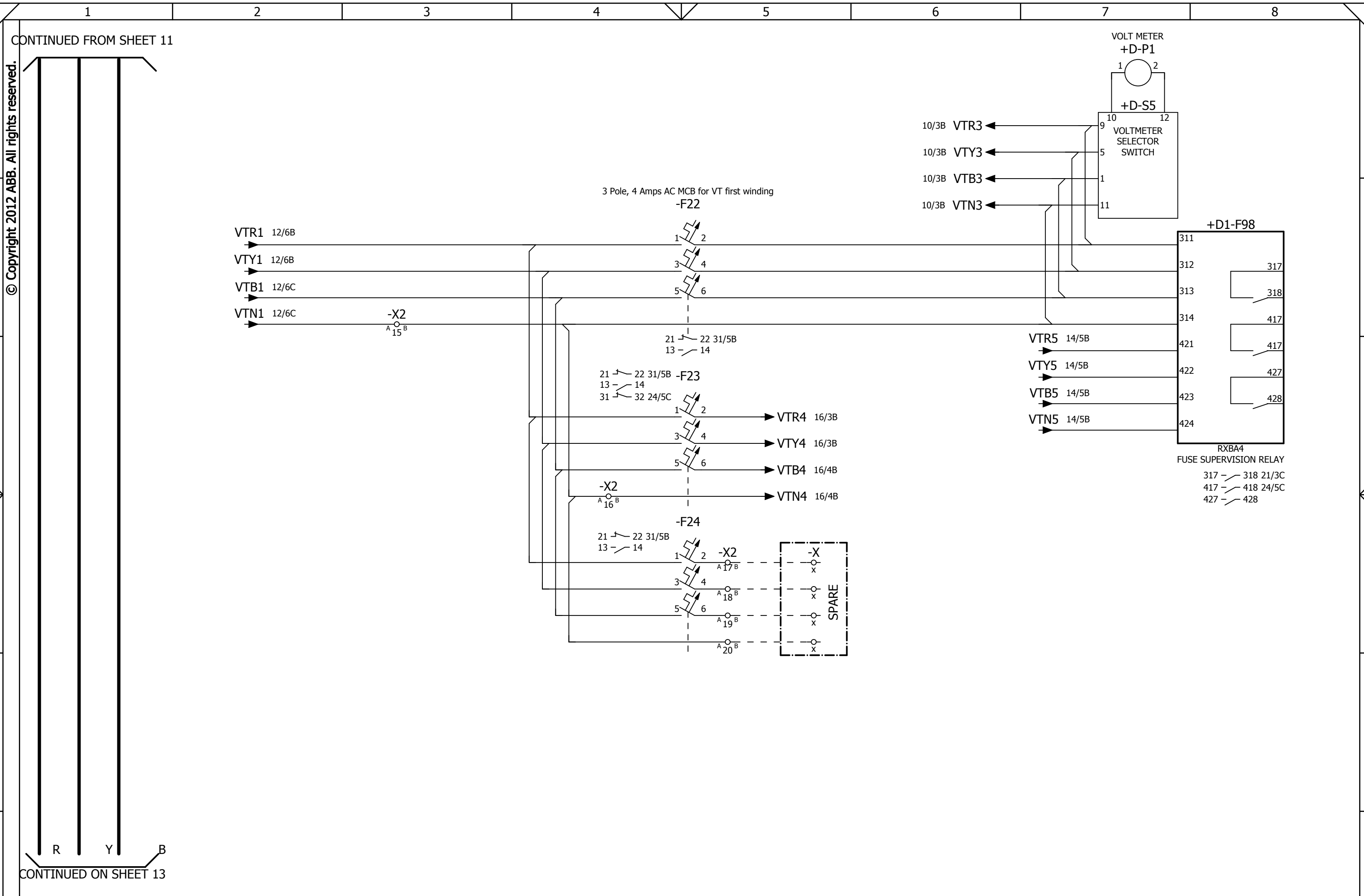
Withdrawable VT Truck in Cable Compartment

$\frac{33000}{1.732} \div \frac{110}{1.732} \div \frac{110}{1.732}$ VOLTS
WDG.#1 25VA, Class 0.2/3P
WDG.#2 25VA, Class 0.2/3P



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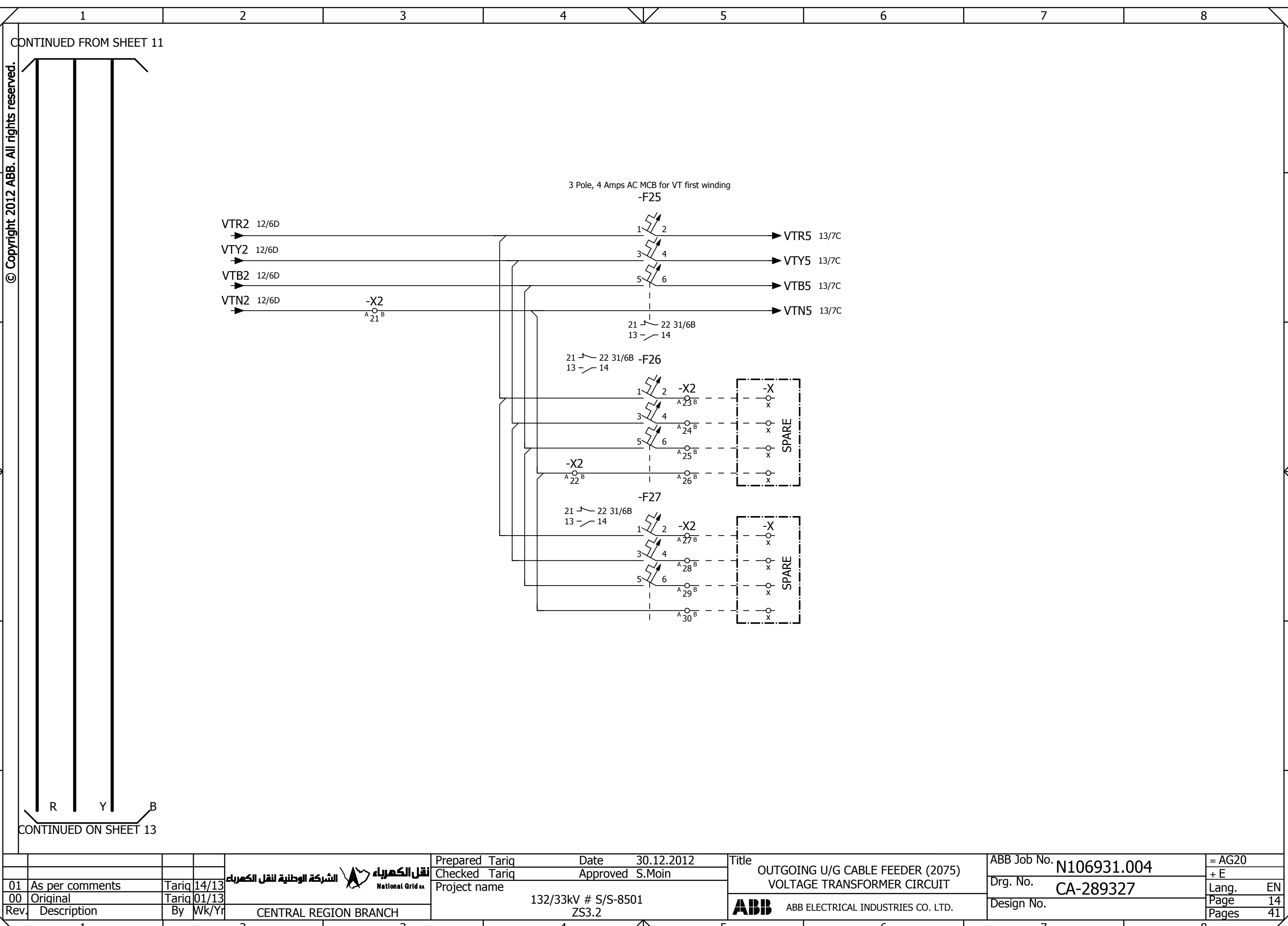
				<div><div>الشركة الوطنية لنقل الكهرباء</div><div>National Grid SA</div></div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) VOLTAGE TRANSFORMER CIRCUIT	ABB Job No. N106931.004	= AG20
					Checked Tariq	Approved S.Moin			+ E
01	As per comments	Tariq 14/13			Project name				Drg. No. CA-289327
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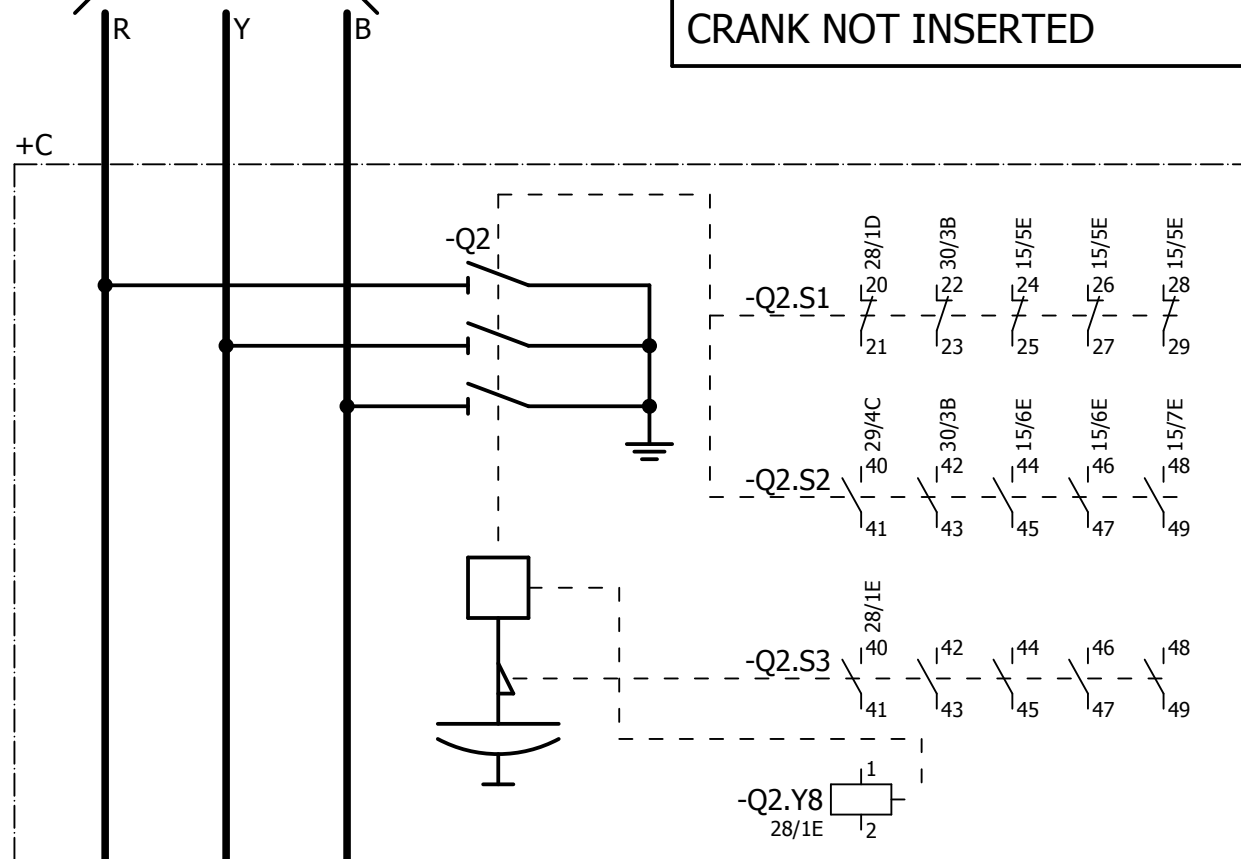
				<div>نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid SA</div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (2075) VOLTAGE TRANSFORMER CIRCUIT	ABB Job No.	N106931.004	= AG20
					Checked Tariq	Approved	S.Moin			+ E		
01	As per comments	Tariq	14/13		Project name					CA-289327	Drg. No.	EN
00	Original	Tariq	01/13					Lang.				
Rev.	Description	By	Wk/Yr		CENTRAL REGION BRANCH	132/33kV # S/S-8501 ZS3.2	ABB		ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Page	13
									Pages	41		



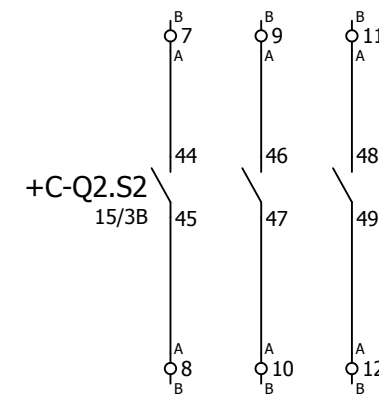
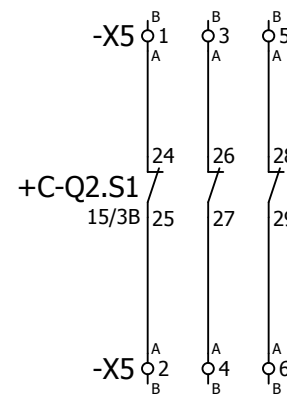
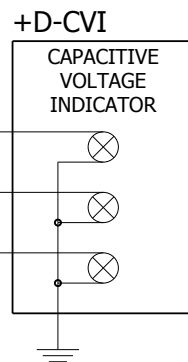
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01	As per comments	Tariq	14/13	Project name		VOLTAGE TRANSFORMER CIRCUIT	Drg. No.	Lang. EN
00	Original	Tariq	01/13				CA-289327	Page 14
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 41

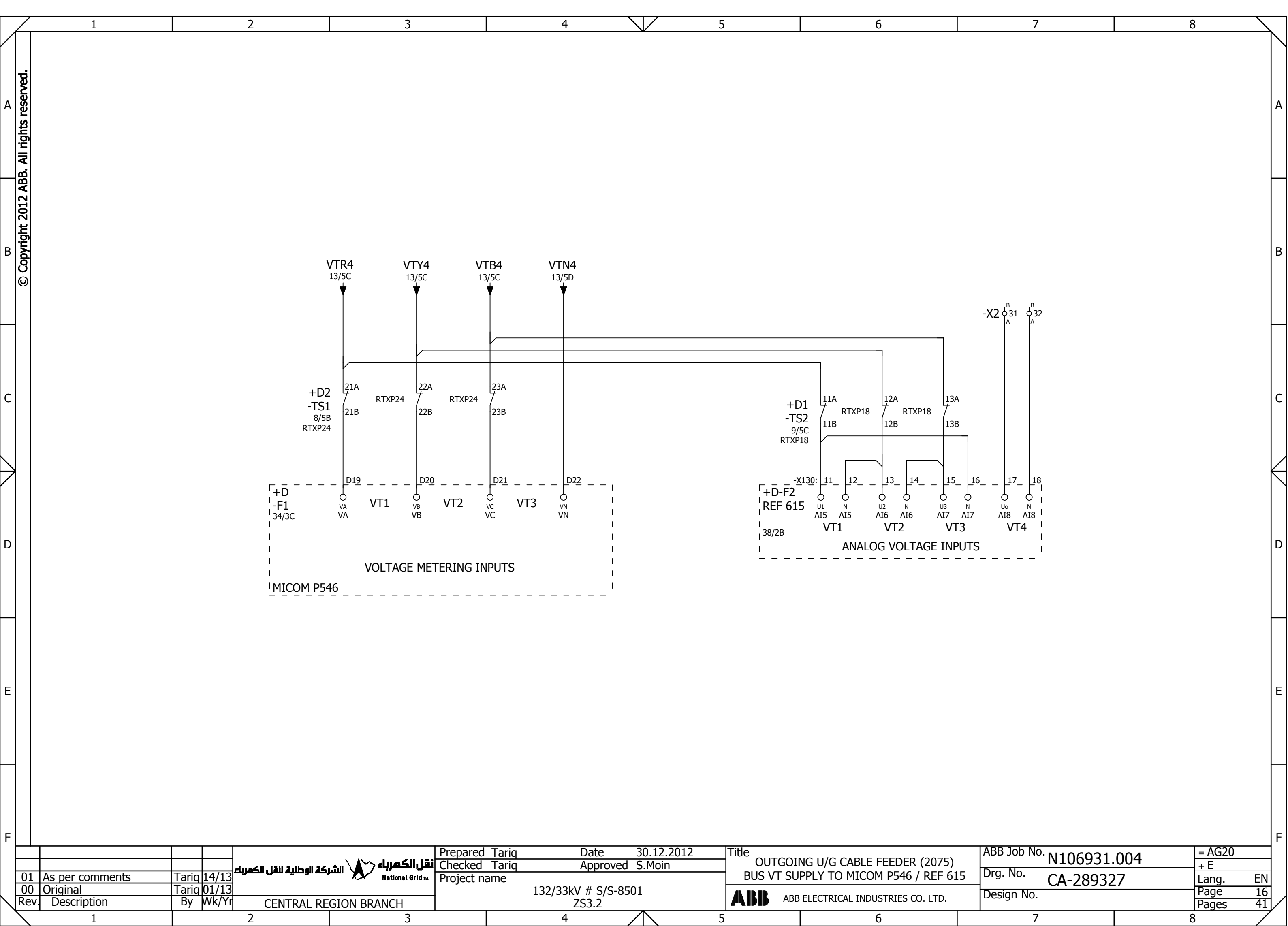
CONTINUED FROM SHEET 12

EARTHING SWITCH OFF AND CRANK NOT INSERTED



DESIGNATION	DESCRIPTION
-Q2.S1	EARTHING SWITCH OFF AND CRANK NOT INSERTED
-Q2.S2	EARTHING SWITCH ON
-Q2.S3	CRANK INSERTED
-Q2.Y8	EARTHING SWITCH BLOCKING COIL

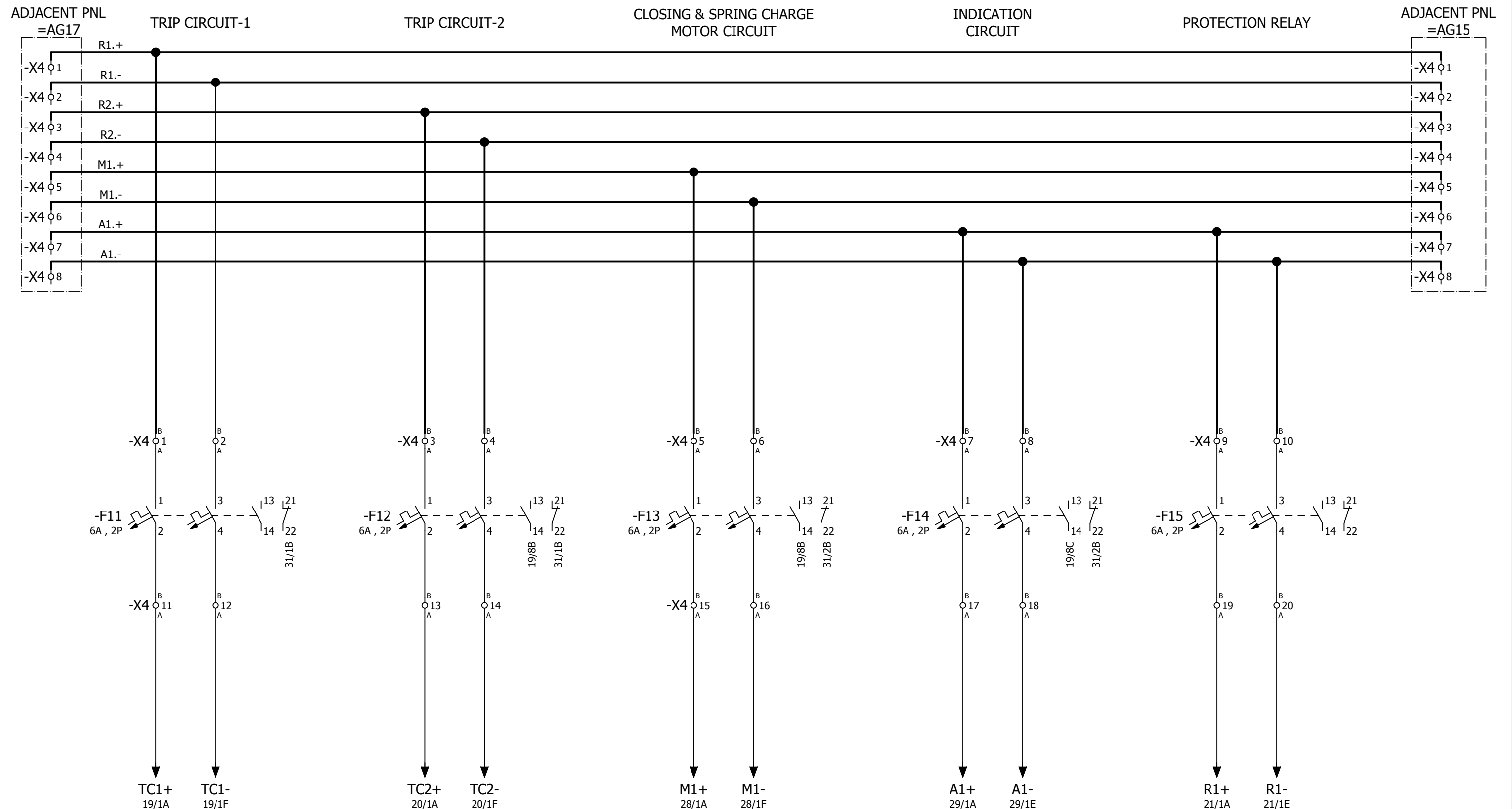





				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG20
				Checked Tariq	Approved S.Moin	OUTGOING U/G CABLE FEEDER (2075)	N106931.004	+ E
01	As per comments	Tariq	14/13	Project name		BUS VT SUPPLY TO MICOM P546 / REF 615	Drg. No.	Lang. EN
00	Original	Tariq	01/13				CA-289327	Page 16
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 41



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				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (2075) DC SUPPLY CIRCUITS	ABB Job No.	N106931.004	= AG20 + E		
					Checked Tariq	Approved	S.Moin							
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2									
00	Original	Tariq	01/13											
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				<div><div><div>ABB</div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div></div>	Design No.			Lang. EN	Page 18	Pages 41

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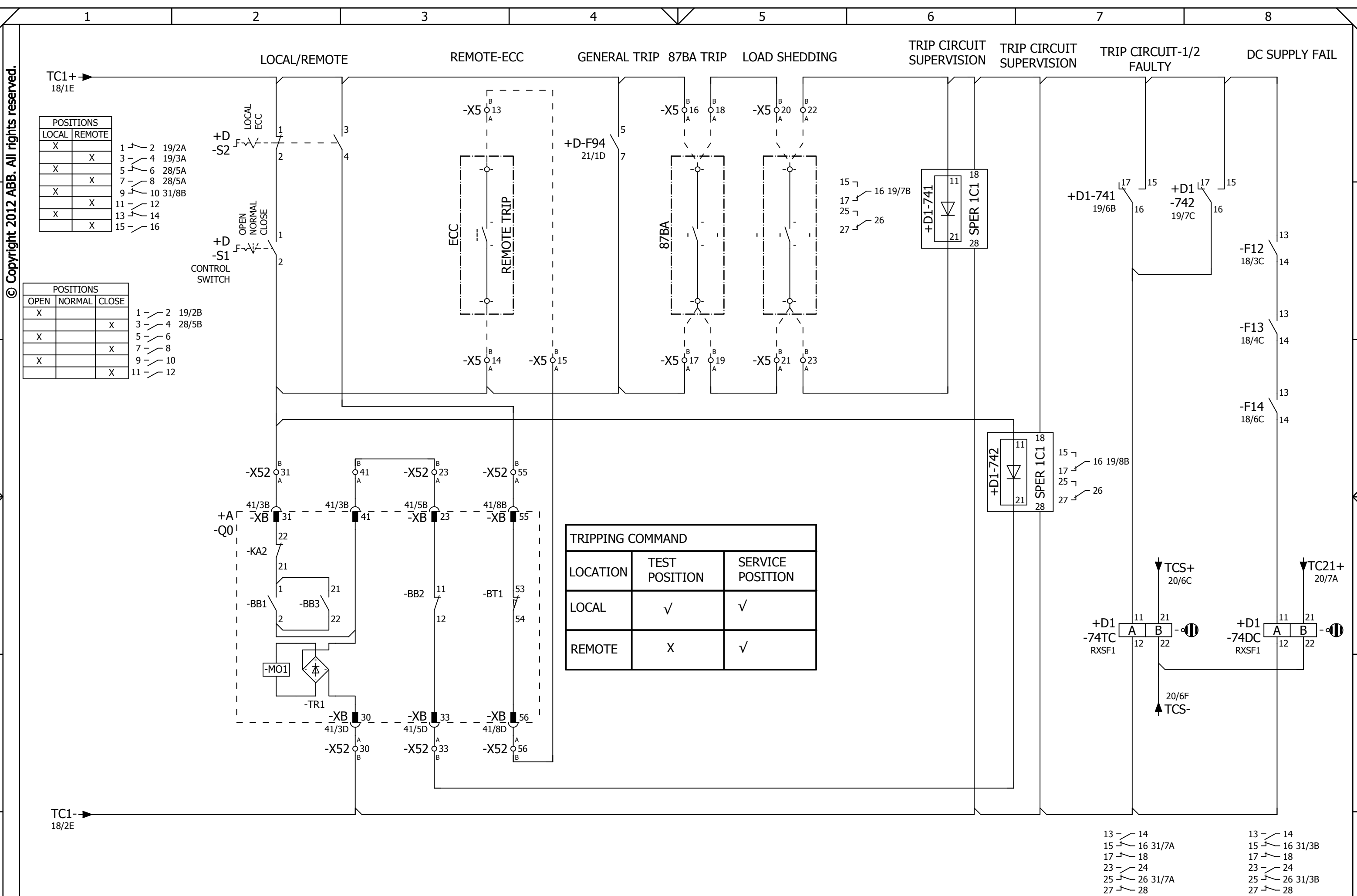
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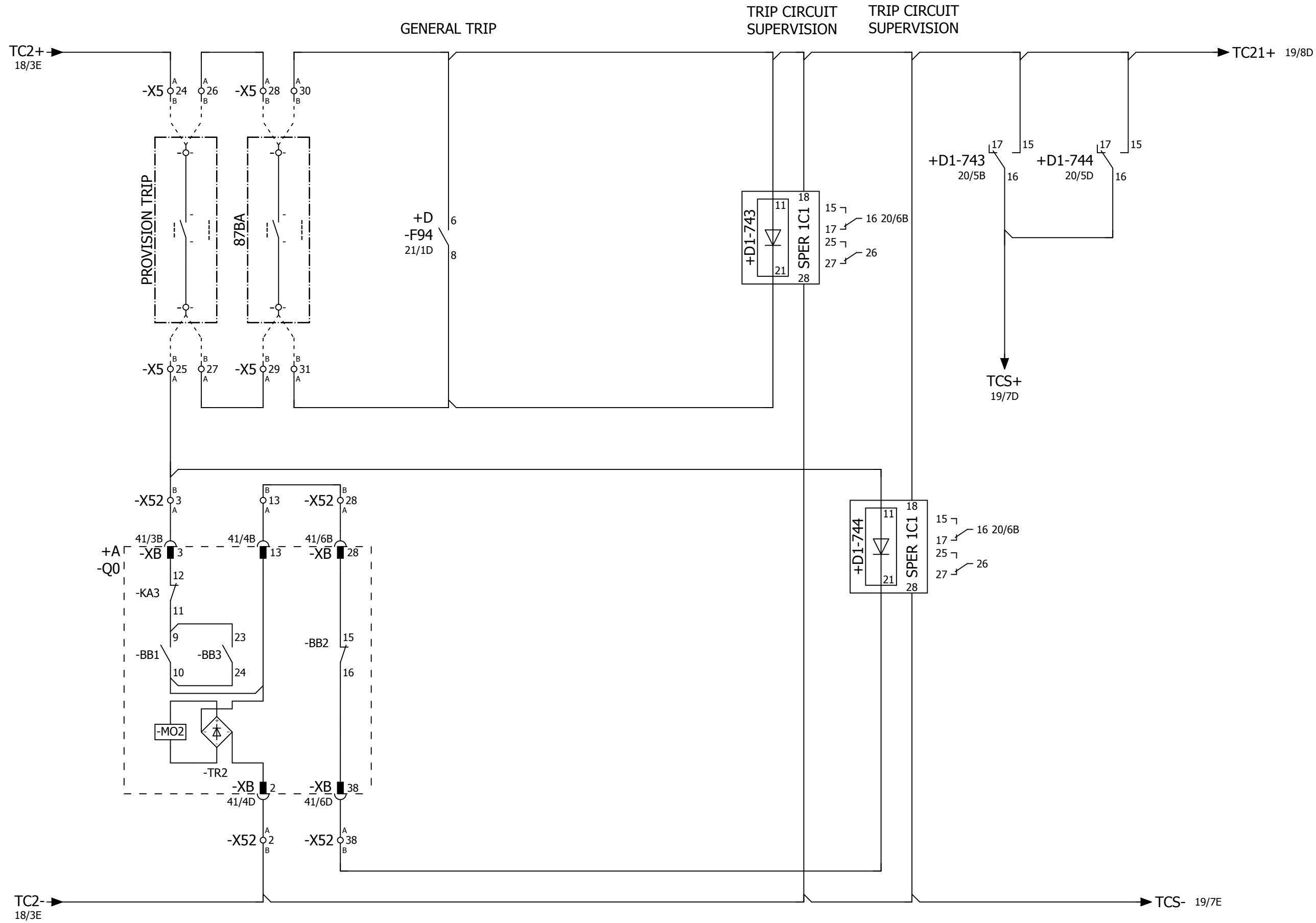
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				 نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) TRIP CIRCUIT-1 & SUPERVISION ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No.	N106931.004	= AG20
					Checked Tariq	Approved S.Moin		Drg. No.	CA-289327	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Design No.	Lang. EN	
00	Original	Tariq	01/13							
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									Pages 41	



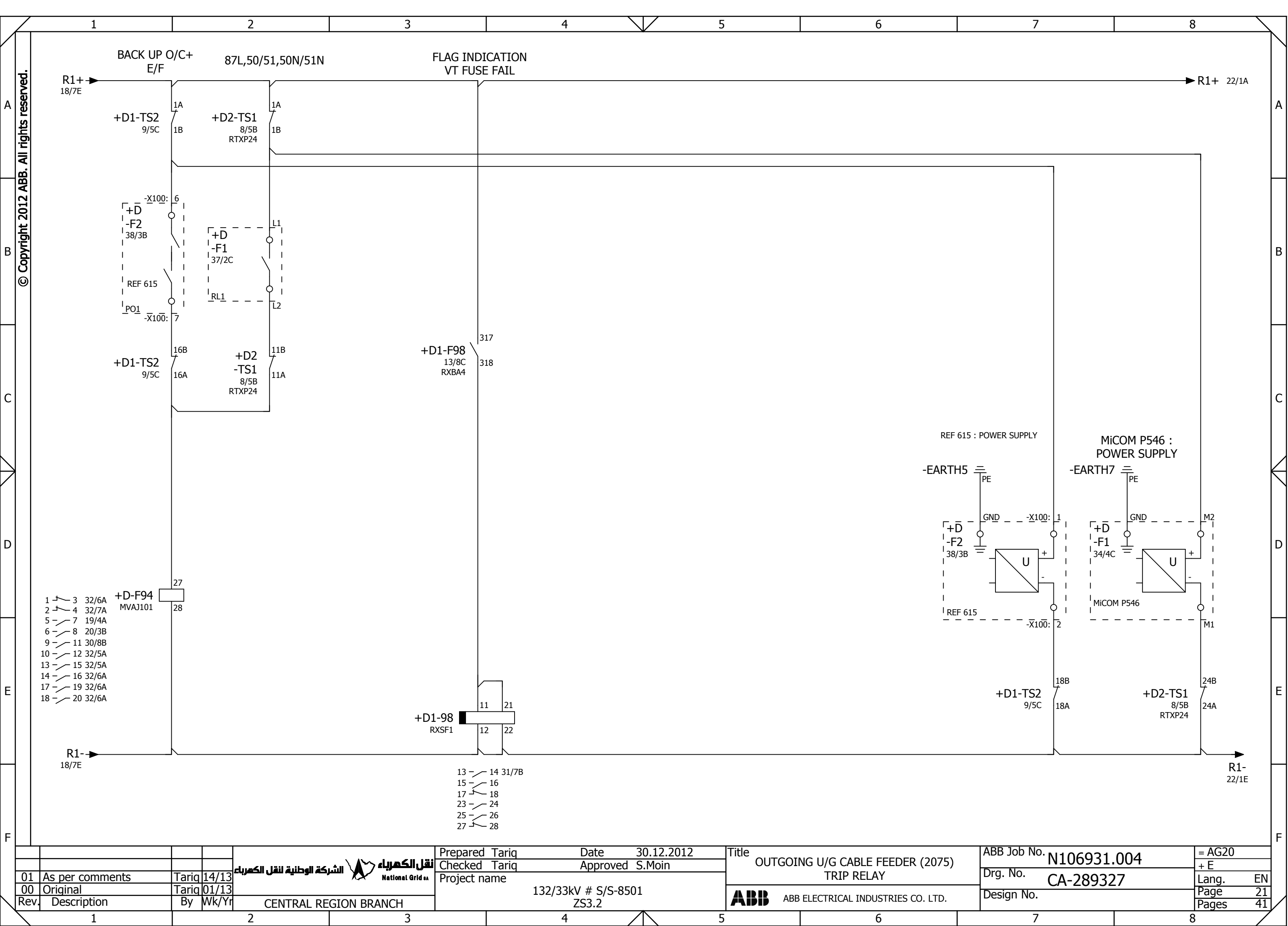
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00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr

الشركة الوطنية لنقل الكهرباء
National Grid sa
CENTRAL REGION BRANCH

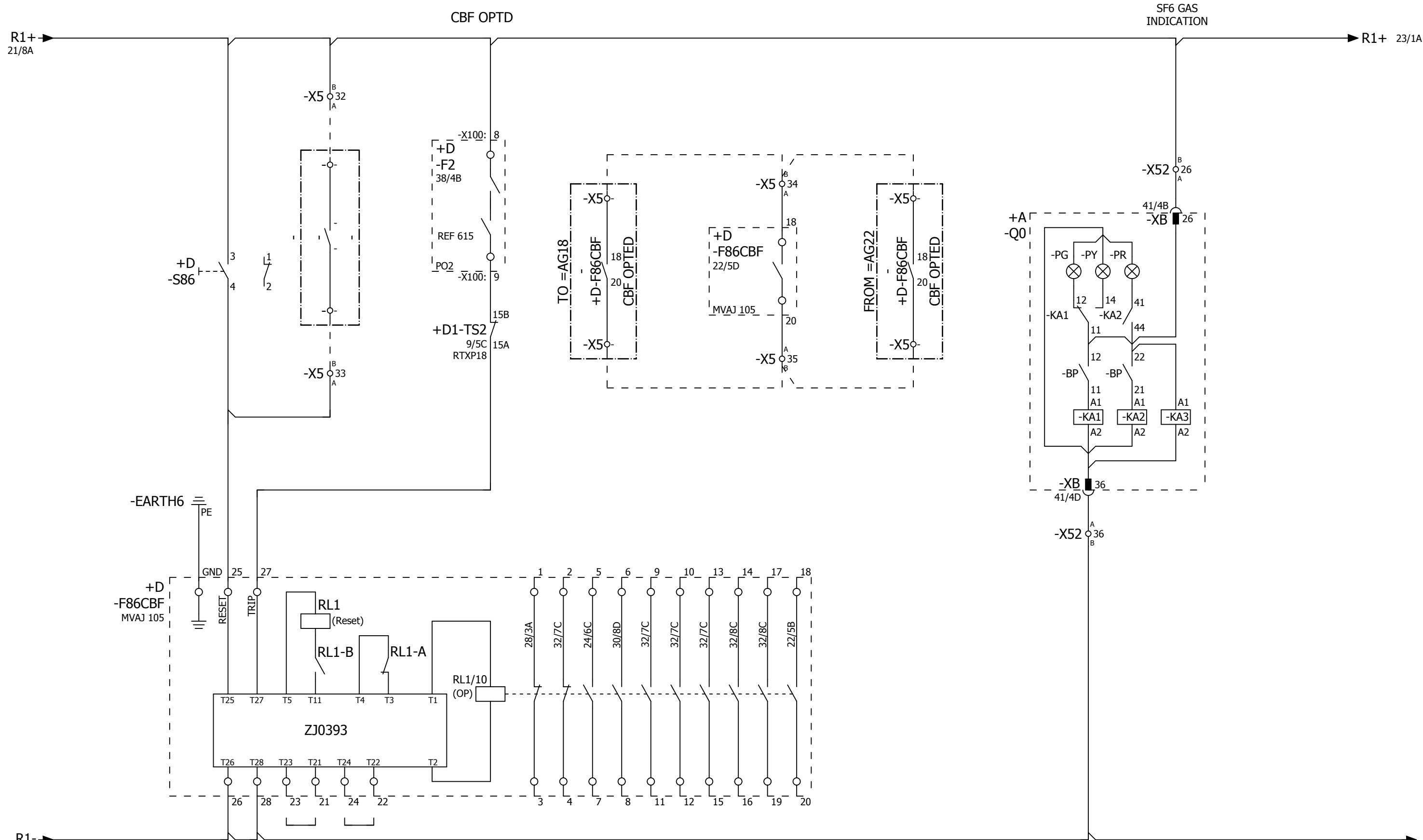
Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING U/G CABLE FEEDER (2075) TRIP CIRCUIT-2 & SUPERVISION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG20
Drg. No.	CA-289327	+ E
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		Pages 41



				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG20
				Checked Tariq	Approved S.Moin	OUTGOING U/G CABLE FEEDER (2075)	N106931.004	+ E
01	As per comments	Tariq	14/13	Project name		TRIP RELAY	Drg. No.	Lang. EN
00	Original	Tariq	01/13				CA-289327	Page 21
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 41




(NOTE 2)

(NOTE 1)

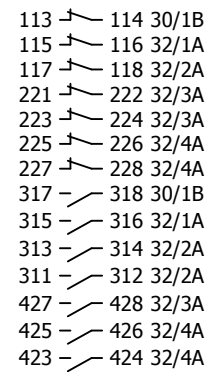
NOTE 1:
LINK IN FOR HIGH BURDEN AS SUPPLIED
LINK OUT FOR LOW BURDEN

NOTE 2:
LINK TO ENABLE RESET INHIBITOR/ECONOMISING COIL



				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid sa</div></div></div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) CBF STAGE-2 LOCKOUT RELAY <div><div><div>ABB</div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div></div>	ABB Job No.	N106931.004	= AG20		
					Checked Tariq	Approved S.Moin			Drg. No.	CA-289327	+ E	
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Design No.		Lang.	EN
00	Original	Tariq	01/13								Page	22
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Pages	41		

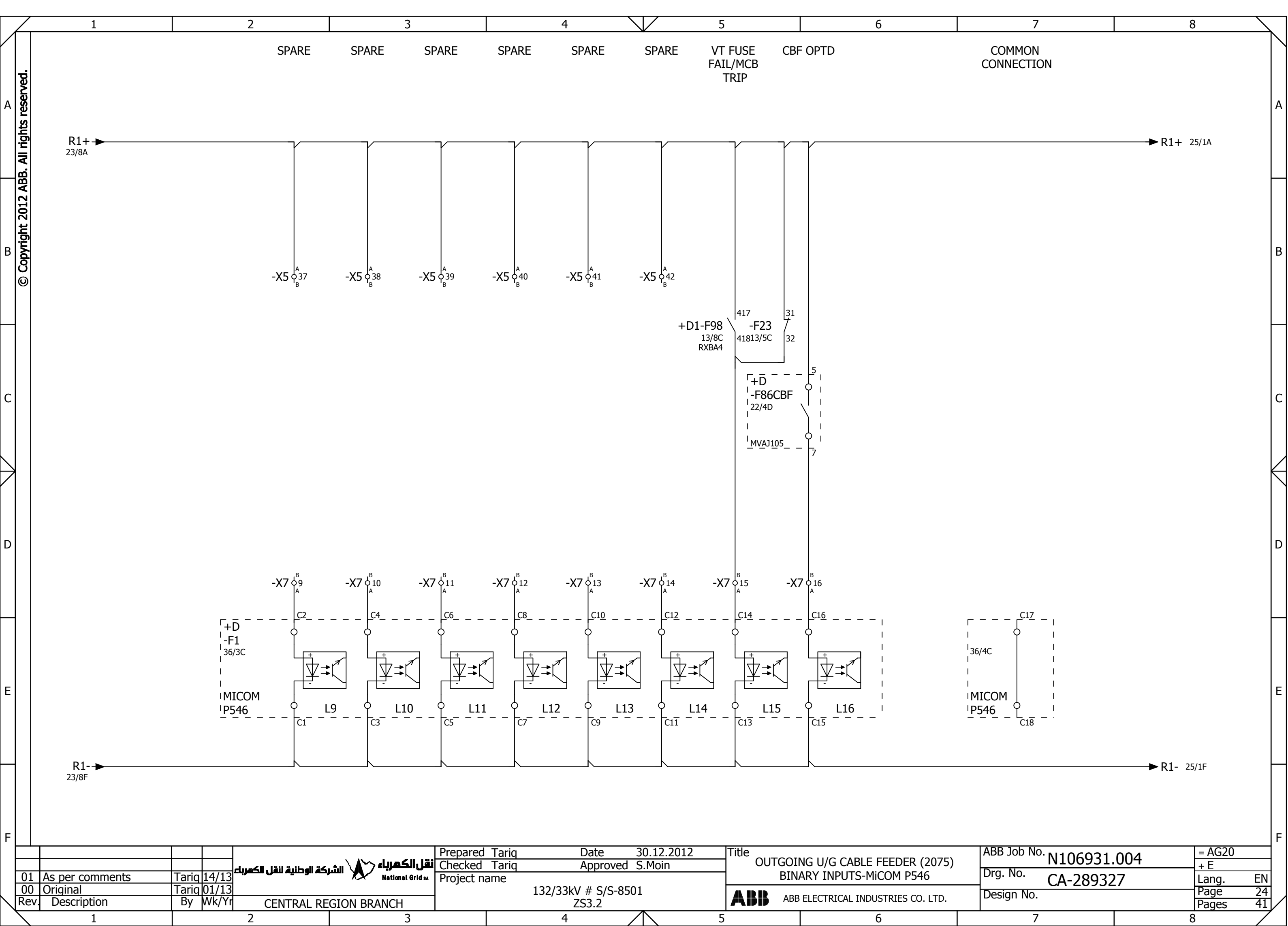
COMMON CONNECTION

► R1+ 24/1A

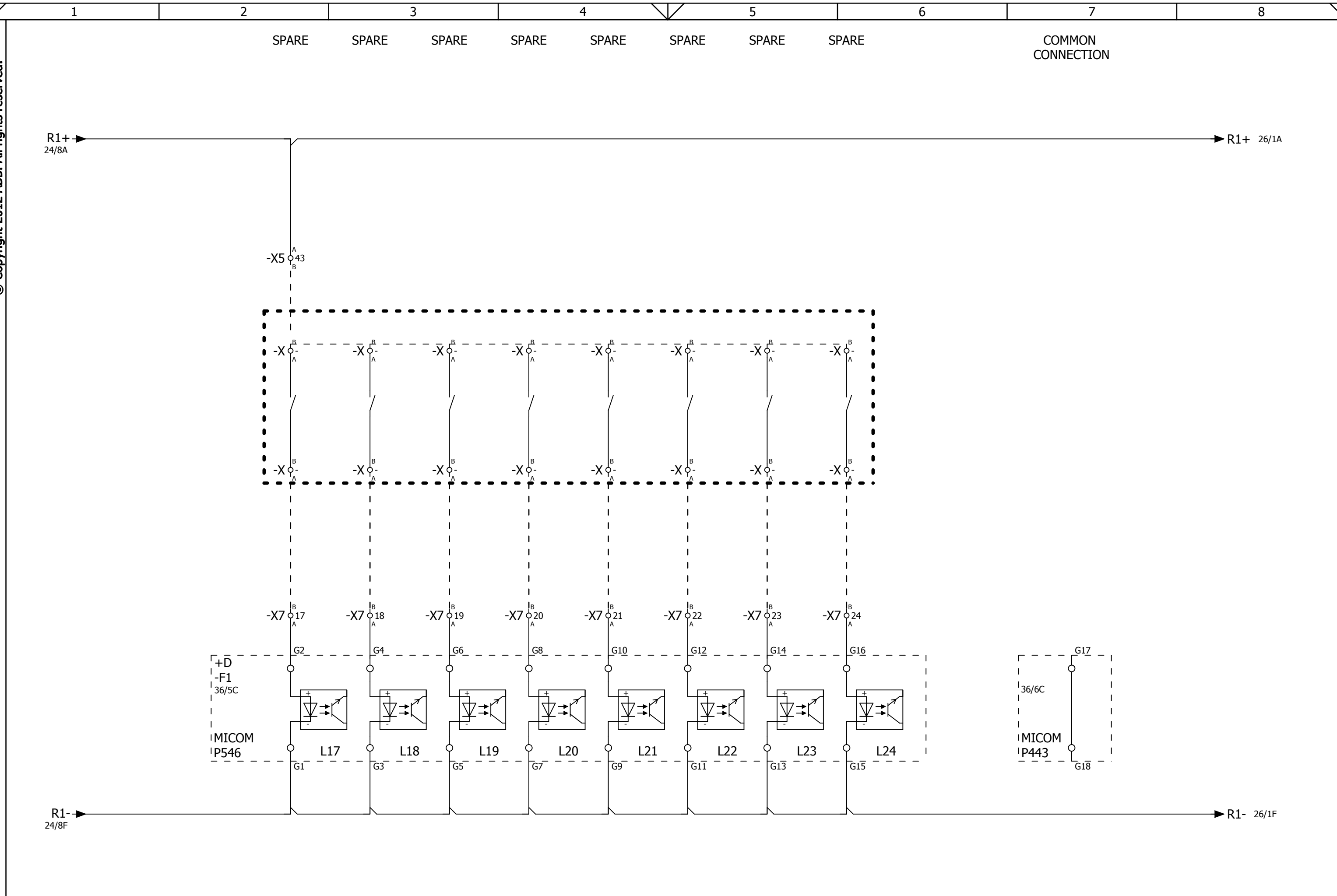


► R1- 24/1F

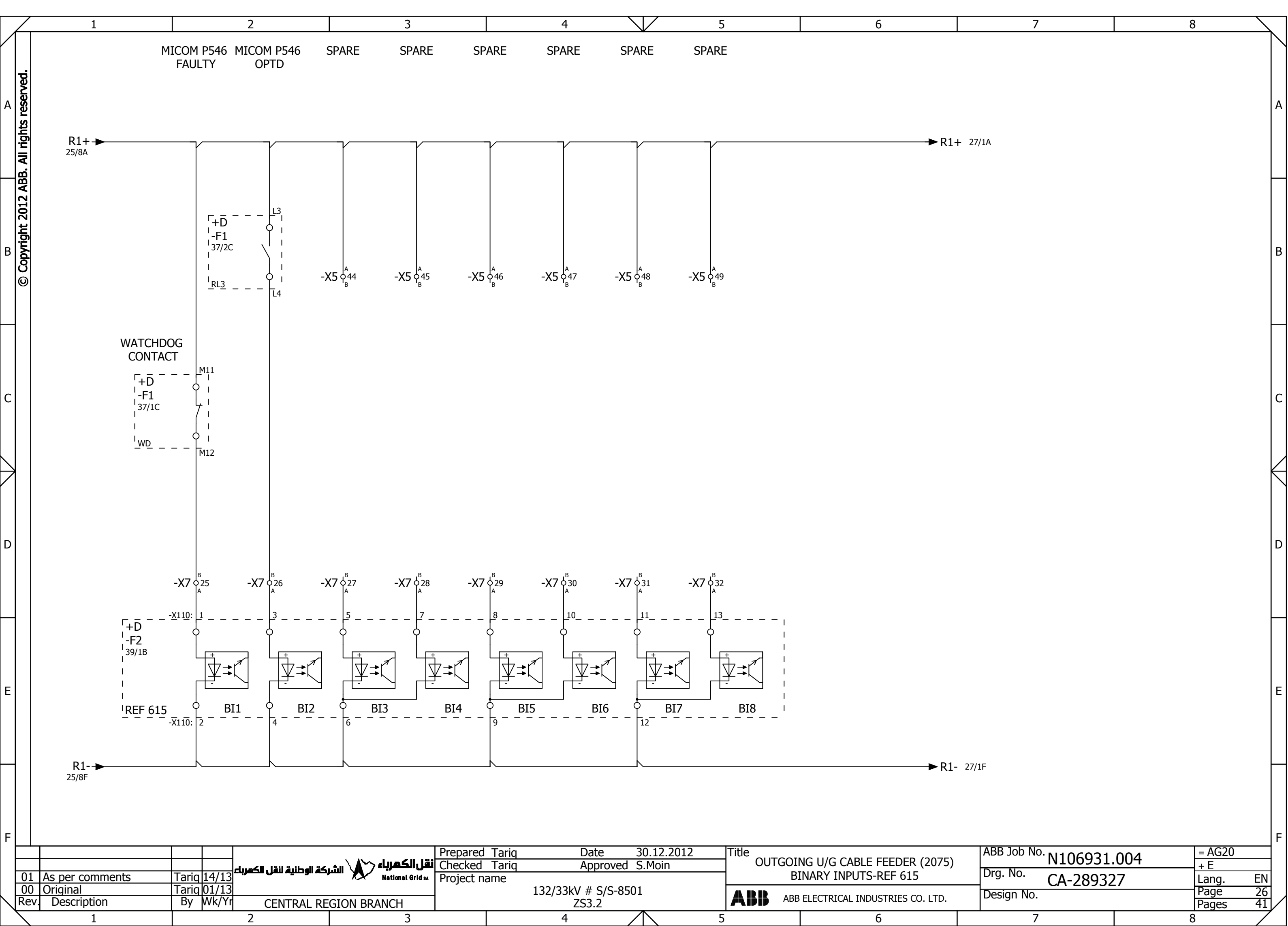
				 نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (2075) BINARY INPUTS-MiCOM P546	ABB Job No.	N106931.004	= AG20	
					Checked Tariq	Approved	S.Moin						
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name	132/33kV # S/S-8501 ZS3.2	 ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	CA-289327	Lang.	EN	
00	Original	Tariq	01/13										
Rev.	Description	By	Wk/Yr									Page	23
												Pages	41



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				Prepared Tariq		Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) BINARY INPUTS-MICOM P546 ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No. N106931.004		= AG20
				Checked Tariq		Approved S.Moin		Drg. No. CA-289327		+ E
01 As per comments		Tariq 14/13		Project name		132/33kV # S/S-8501 ZS3.2				Lang. EN
00 Original		Tariq 01/13		CENTRAL REGION BRANCH				Design No.		Page 25
Rev.	Description	By	Wk/Yr							Pages 41

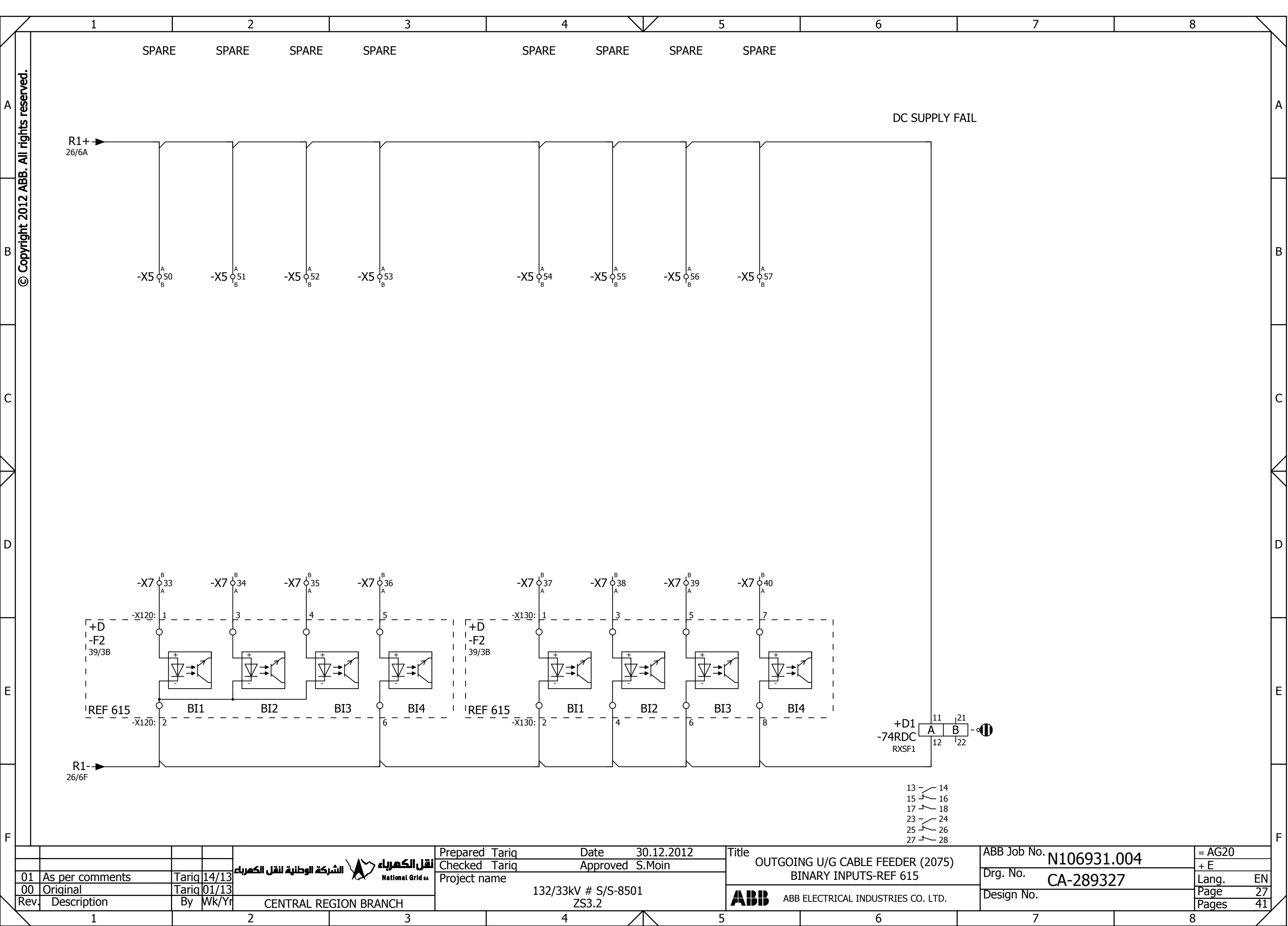


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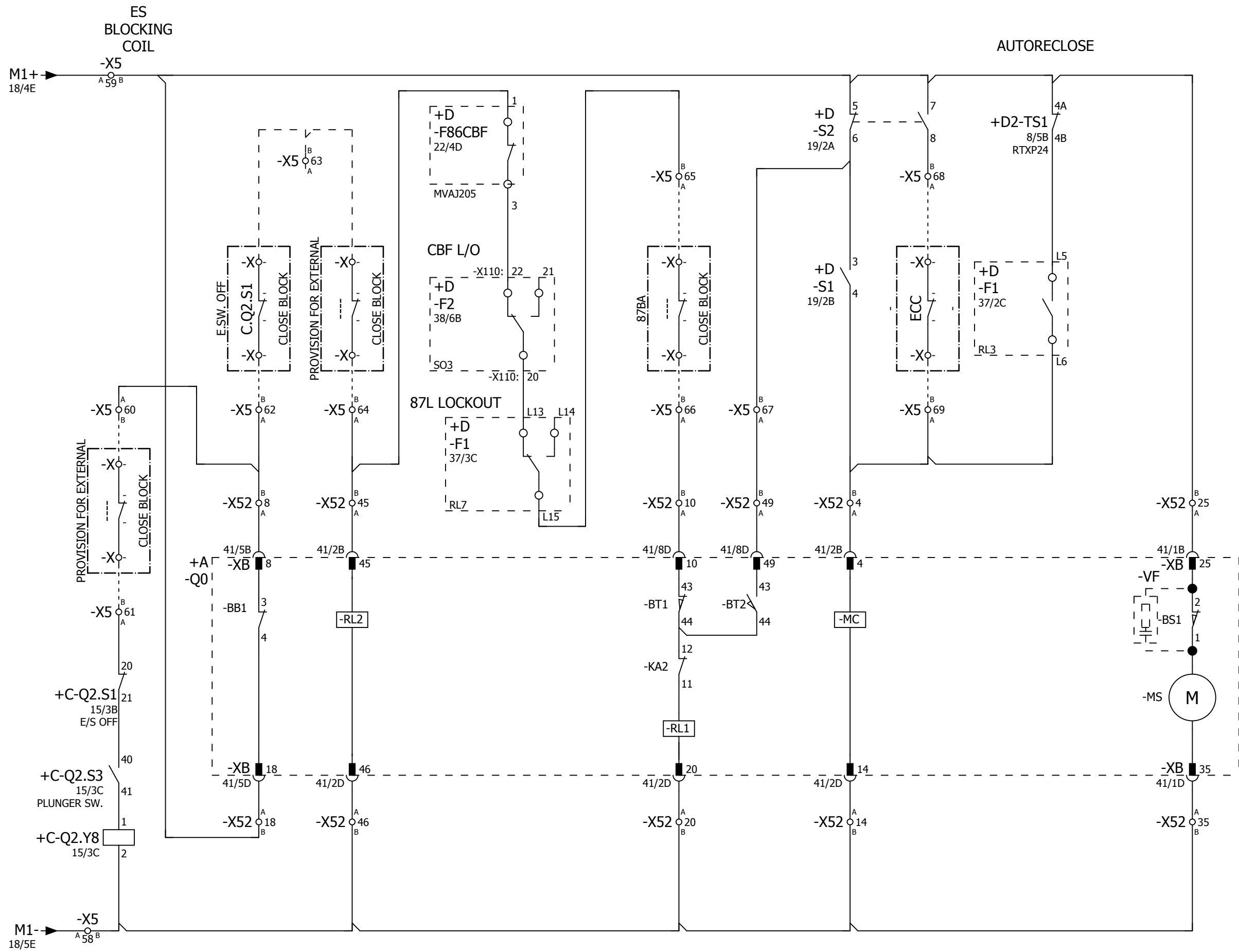
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01	As per comments	Tariq	14/13	
00	Original	Tariq	01/13	
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH




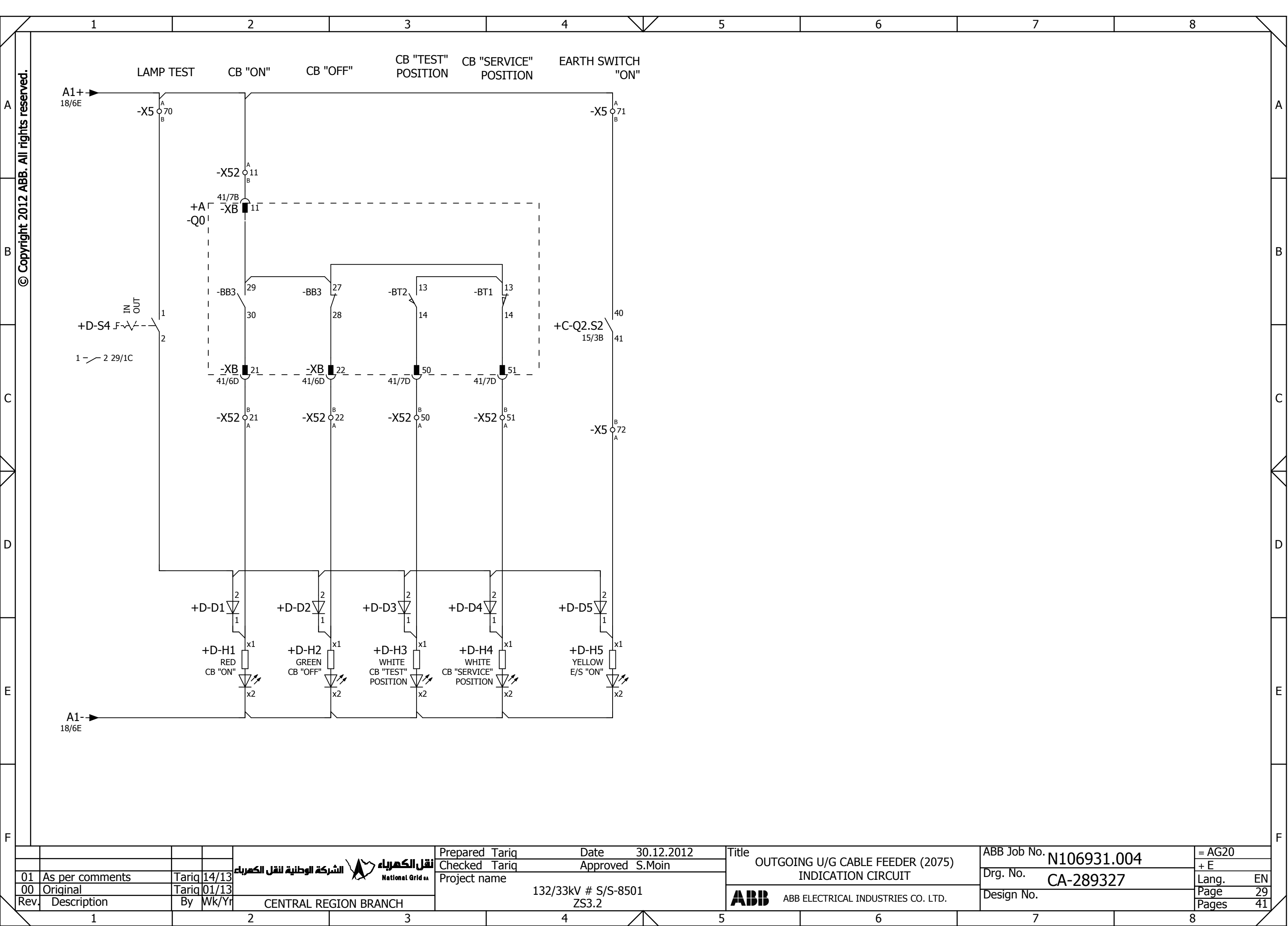
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				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (2075) CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	ABB Job No.	N106931.004	= AG20		
					Checked Tariq	Approved	S.Moin					+ E		
01 As per comments					Tariq	14/13	Project name	132/33kV # S/S-8501 ZS3.2	ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289327	Lang.	EN
00 Original					Tariq	01/13								
Rev.	Description	By	Wk/Yr											
CENTRAL REGION BRANCH														



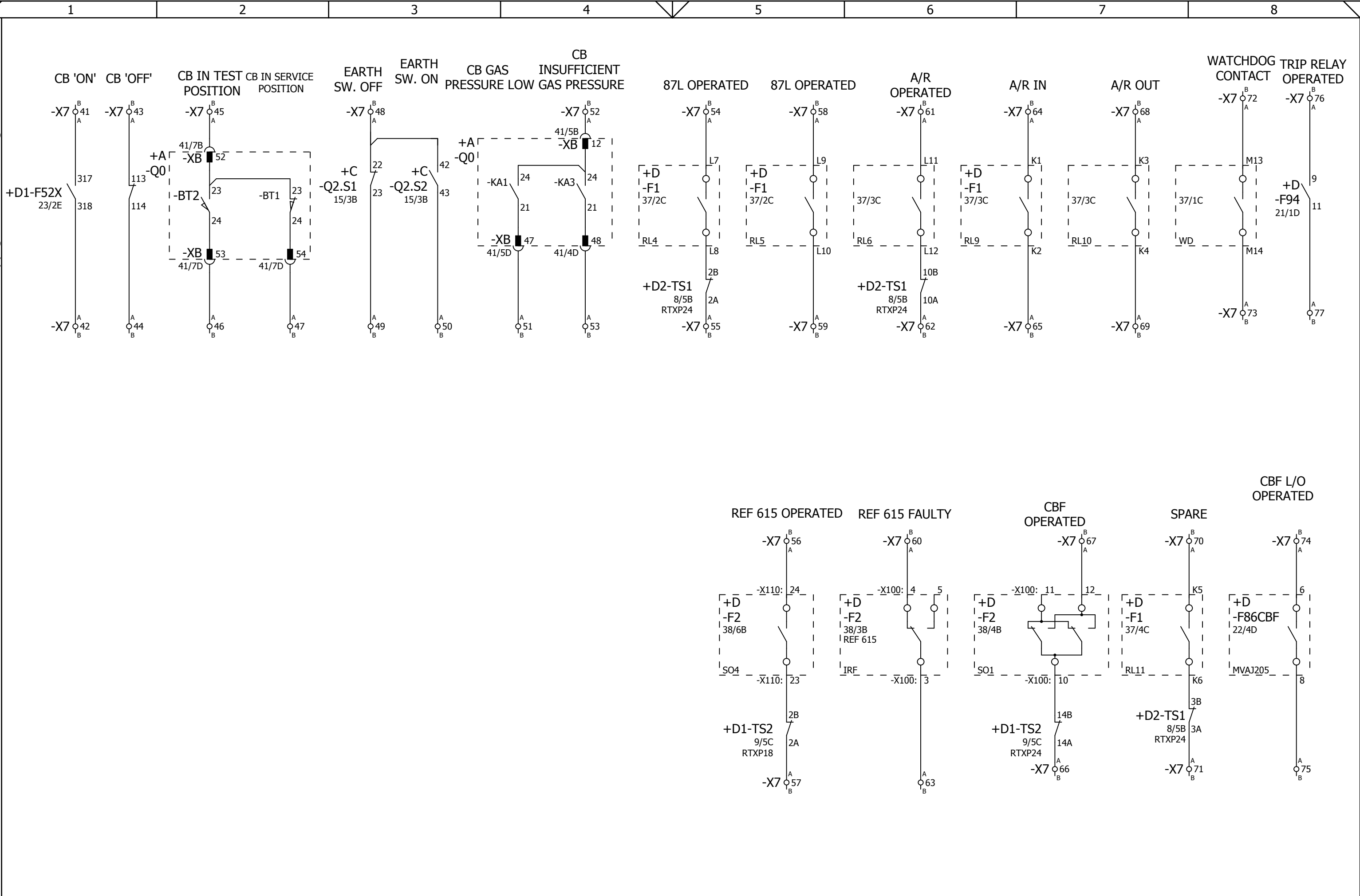
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00	Original	Tariq	01/13	
Rev.	Description	By	Wk/Yr	


CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name 132/33kV # S/S-8501 ZS3.2	

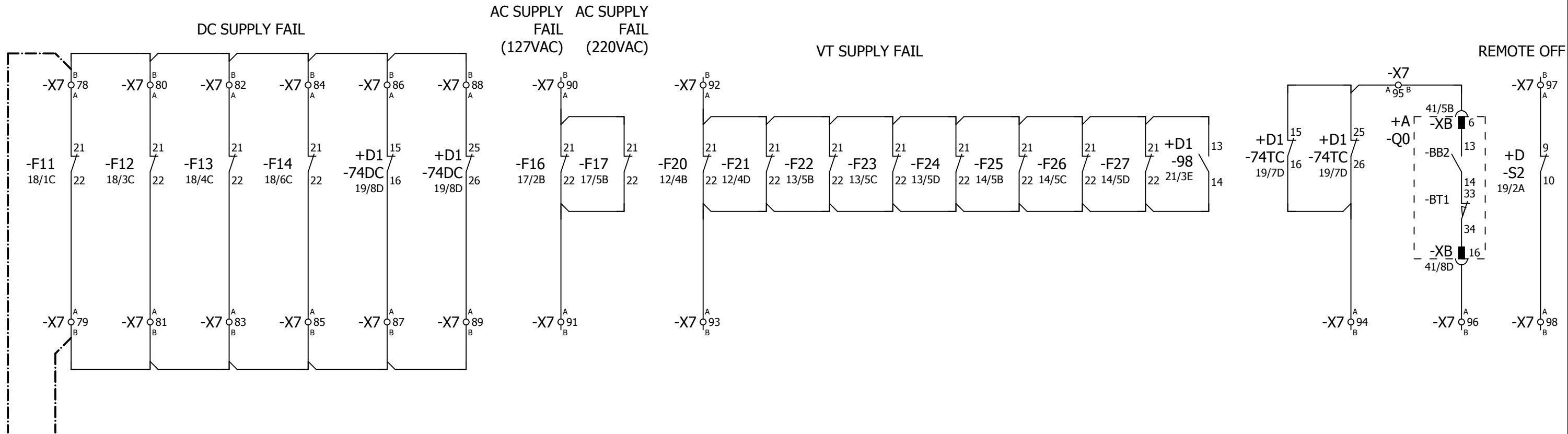
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ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.


ABB Job No.	N106931.004	= AG20
Drg. No.	CA-289327	+ E
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		Page 29
		Pages 41

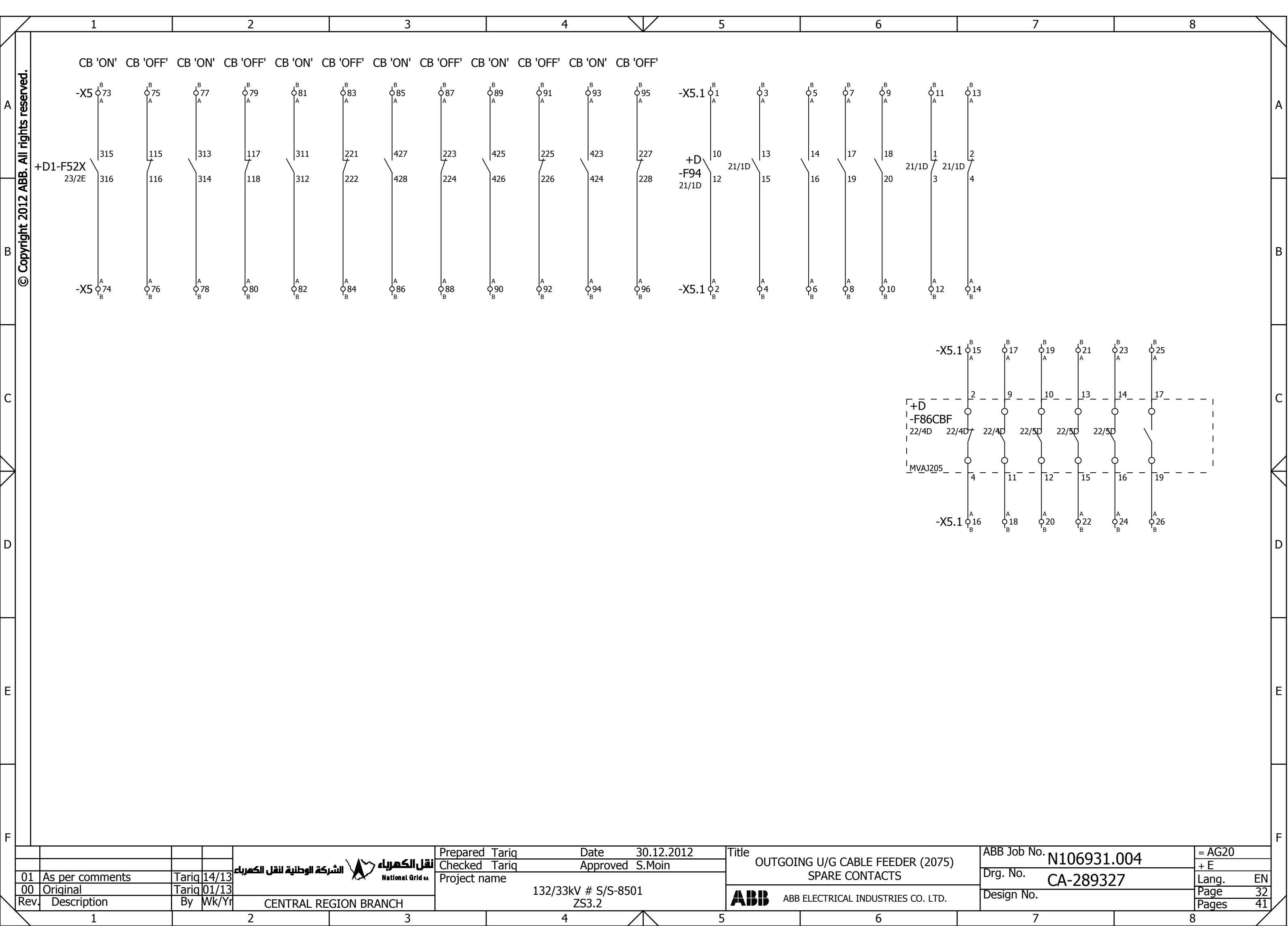


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					Checked Tariq	Approved S.Moin			Drg. No. CA-289327	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Design No.	Lang. EN
00	Original	Tariq	01/13							Page 30
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Pages 41	


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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) CONTACTS TO SCADA ALARM	ABB Job No. N106931.004	= AG20 + E
					Checked Tariq	Approved S.Moin			
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. CA-289327	Lang. EN
00	Original	Tariq	01/13						
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				<div><div>الشركة الوطنية لنقل الكهرباء</div><div>نقل الكهرباء</div><div>National Grid SA</div></div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) SPARE CONTACTS	ABB Job No.	N106931.004	= AG20	
					Checked Tariq	Approved S.Moin				+ E	
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Drg. No.	CA-289327	Lang. EN
00	Original	Tariq	01/13								
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Page 32	
										Pages 41	

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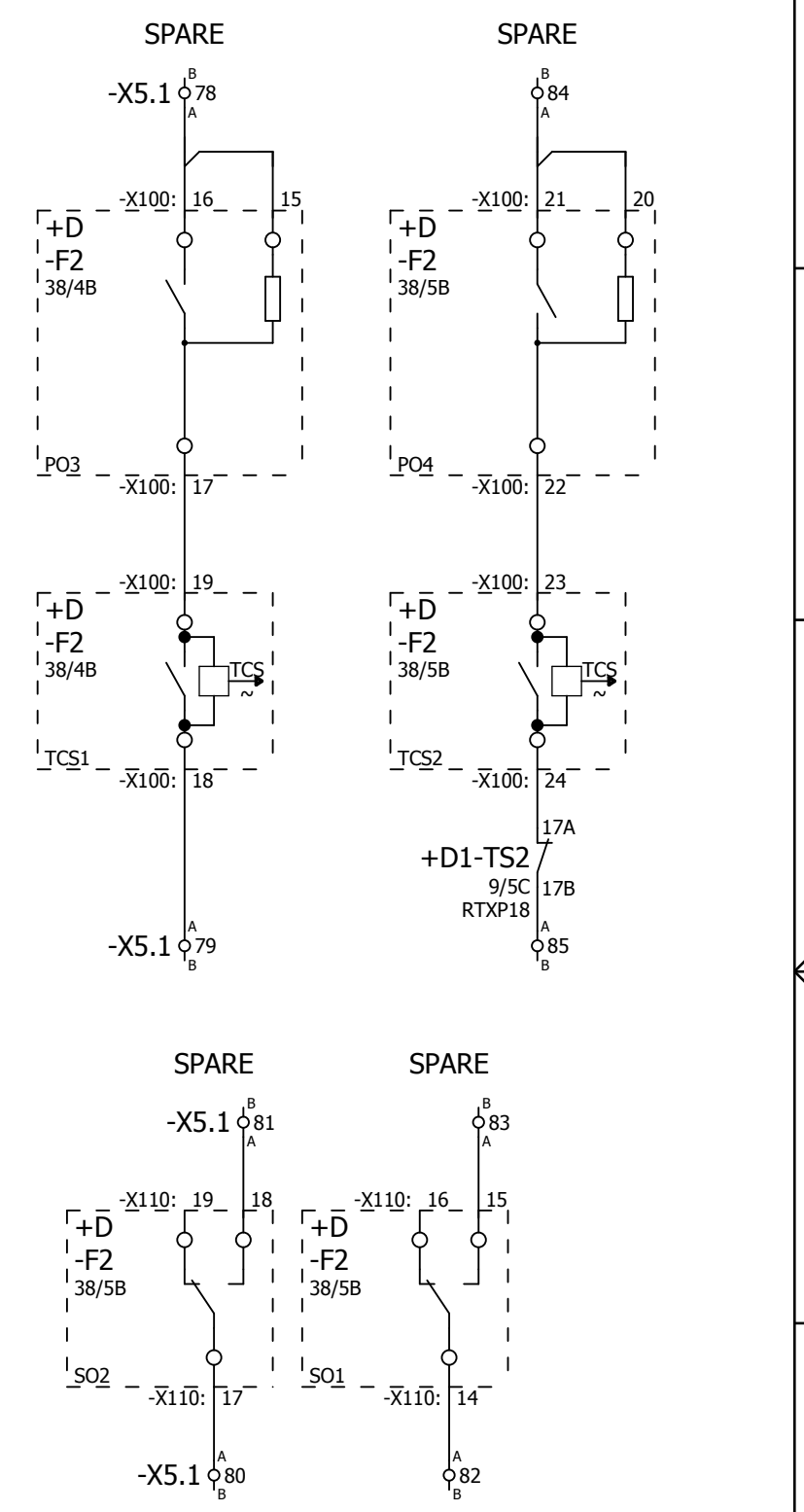
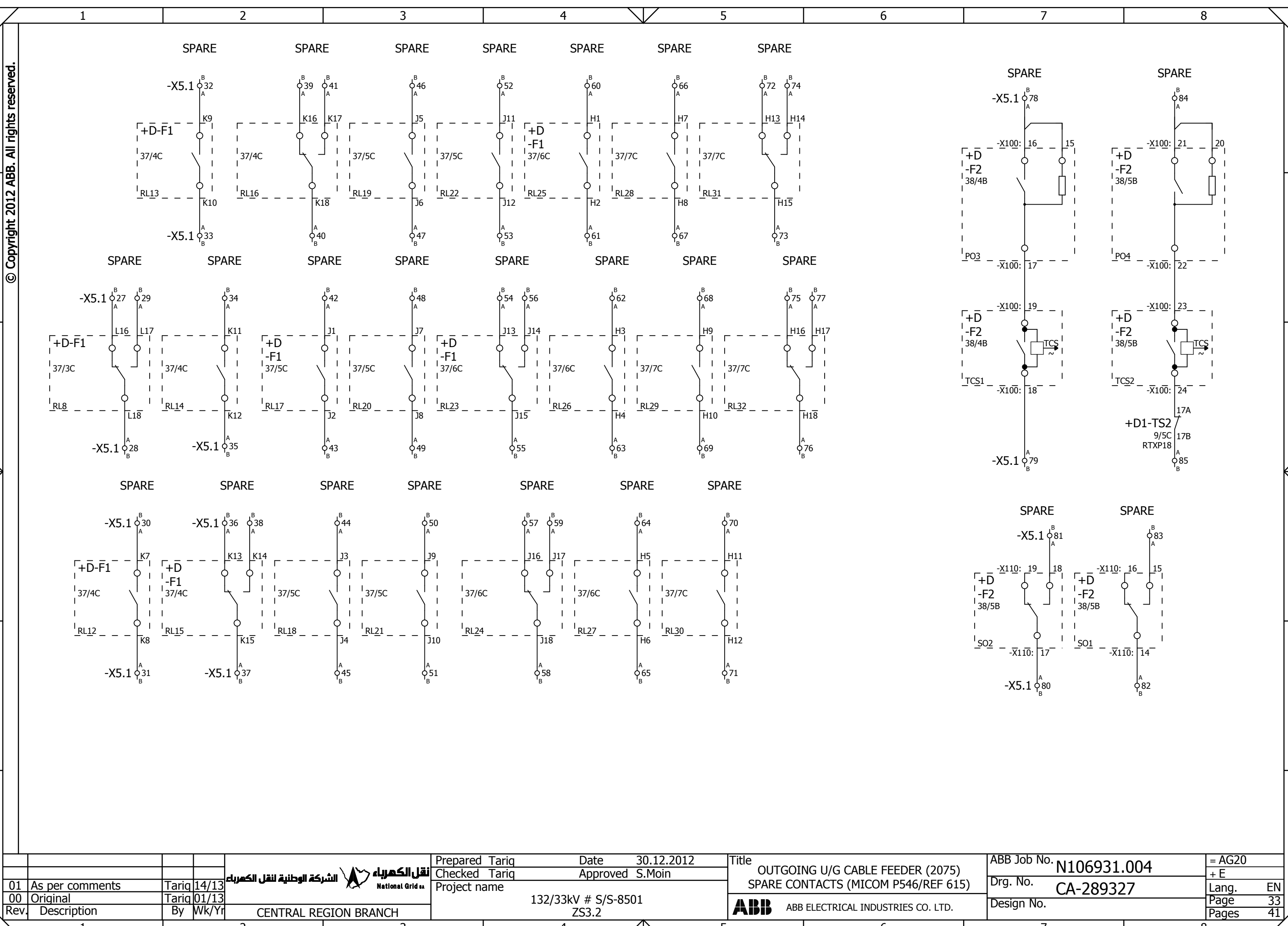
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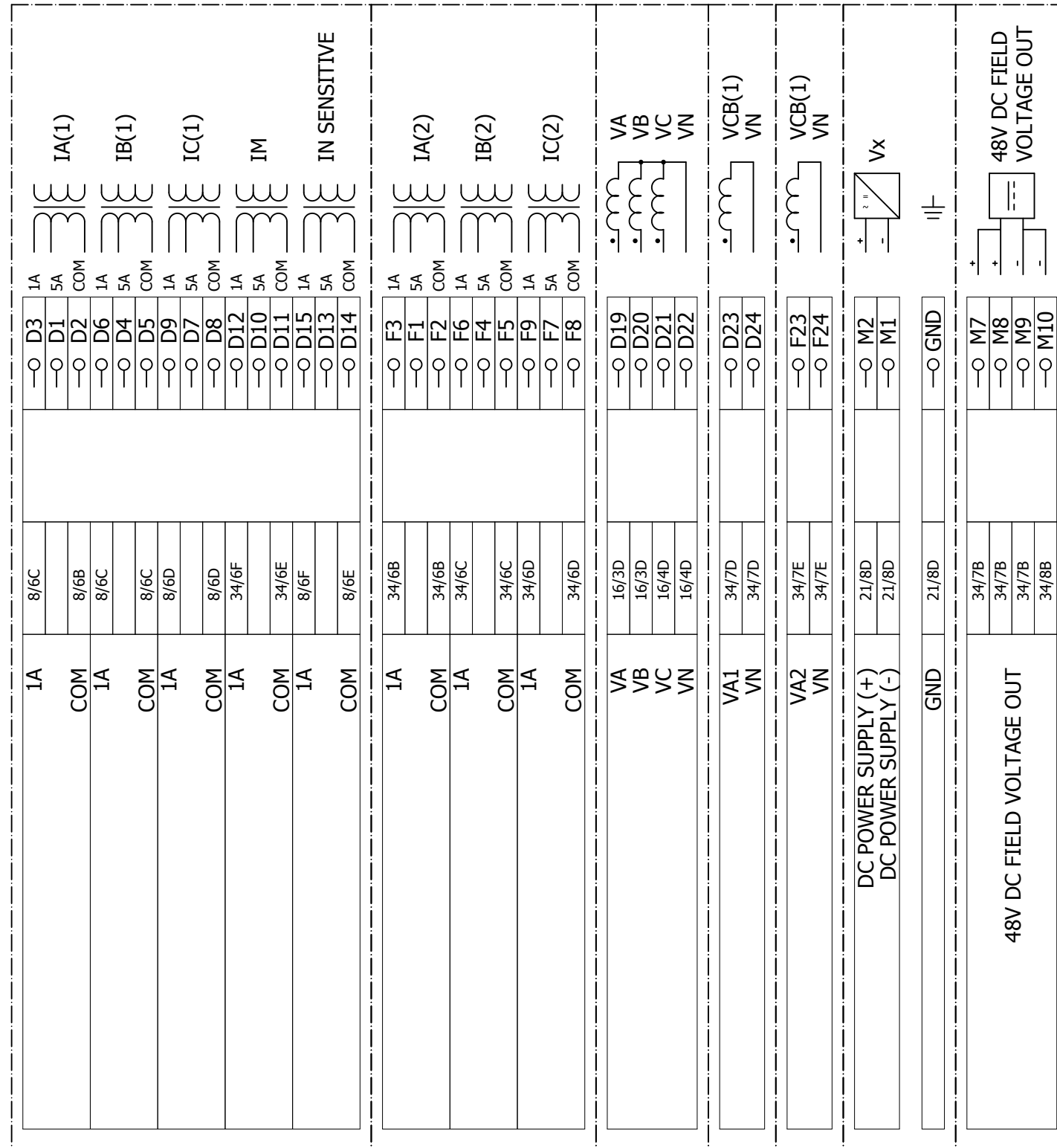


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					Checked Tariq	Approved	S.Moin		Drg. No.	CA-289327	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Design No.	Lang.	EN
00	Original	Tariq	01/13								
Rev.	Description	By	Wk/Yr		CENTRAL REGION BRANCH					Page	33
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MiCOM P546

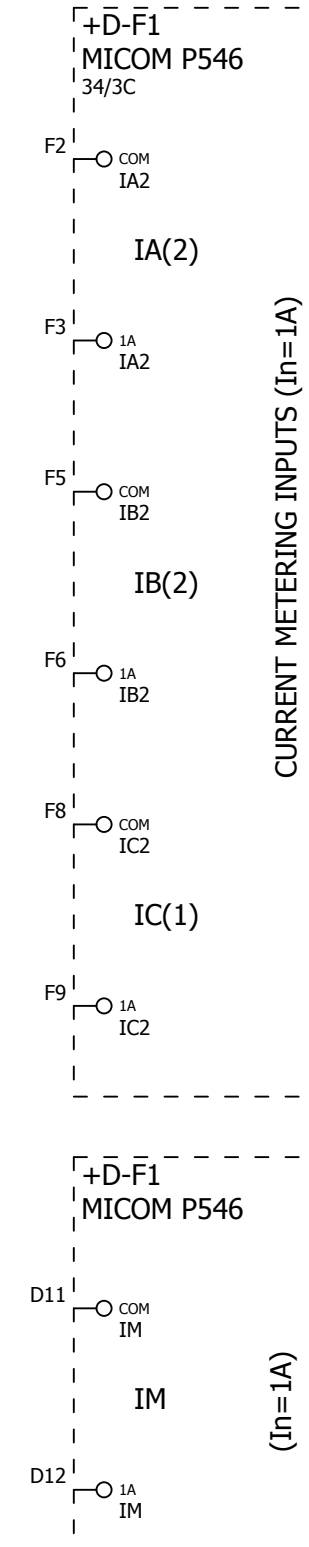
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MiCOM P546 : MULTIFUNCTION LINE DIFFERENTIAL RELAY

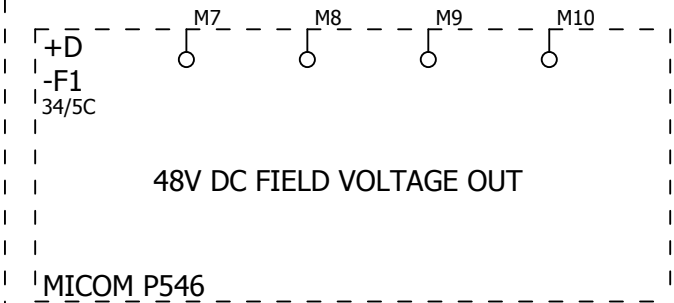


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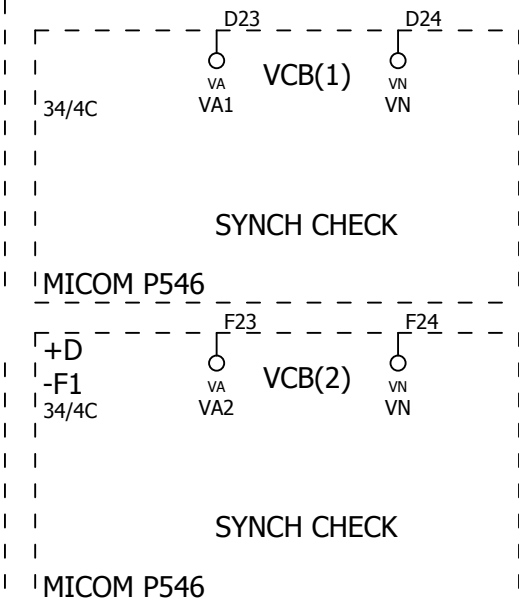
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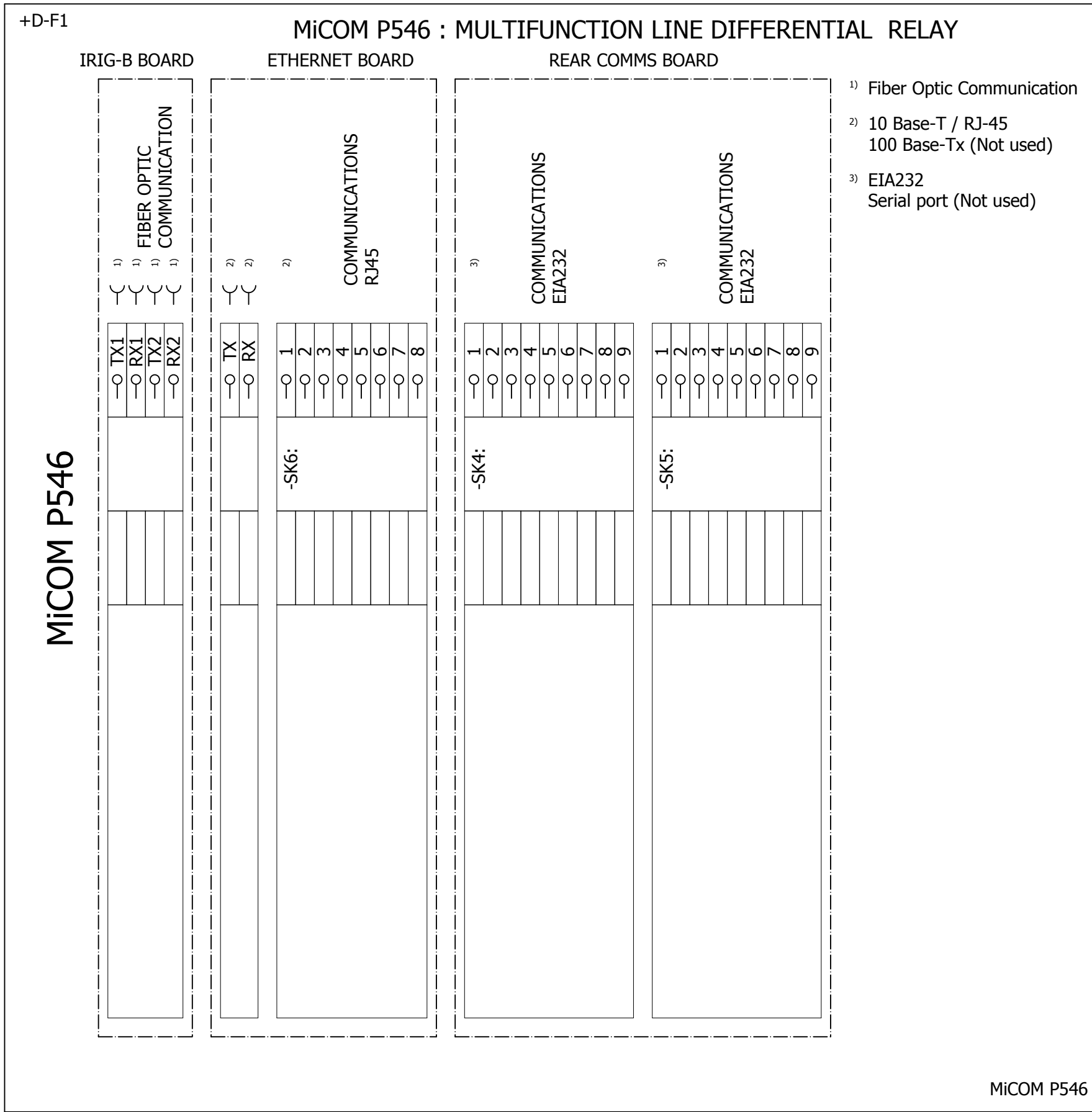


MICOM P546 : 48V DC FIELD VOLTAGE OUT

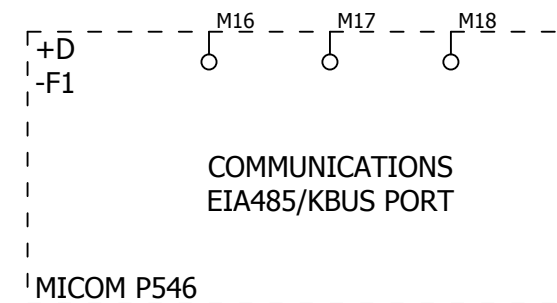


MICOM P546 : VOLTAGE METERING INPUTS





MICOM P546 : COMMUNICATIONS RS485



				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG20
				Checked Tariq	Approved S.Moin	OUTGOING U/G CABLE FEEDER (2075)	N106931.004	+ E
01	As per comments	Tariq	14/13	Project name		MiCOM P546 - COMMUNICATION PORTS	Drg. No.	Lang. EN
00	Original	Tariq	01/13				CA-289327	Page 35
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 41

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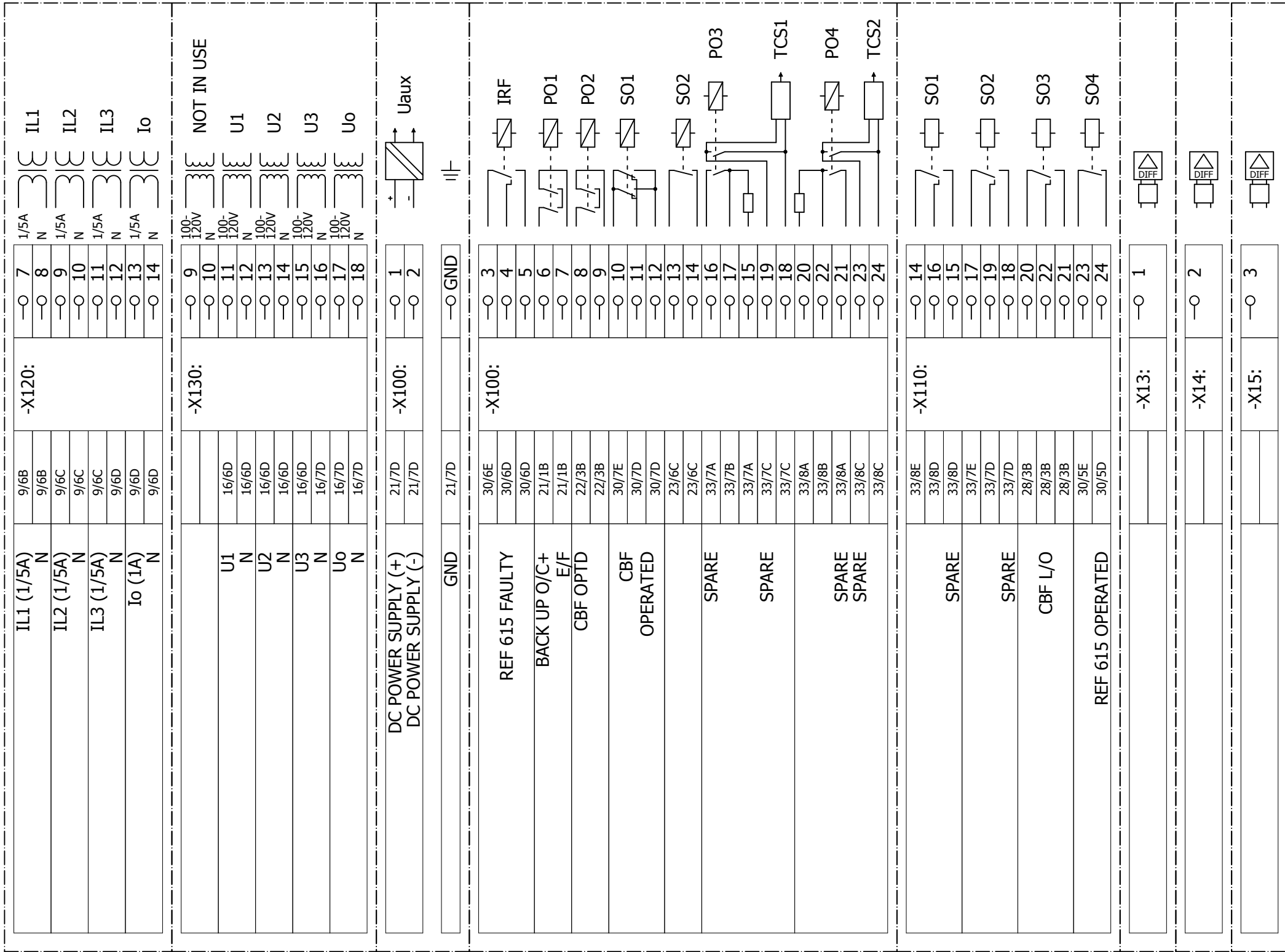
MiCOM P546

				<div><div><div><div></div><div>الشركة الوطنية لنقل الكهرباء</div><div>National Grid SA</div></div></div></div>	Prepared Tariq	Date	30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) MiCOM P546 - OUTPUTS	ABB Job No.	N106931.004	= AG20
					Checked Tariq	Approved	S.Moin				+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2						
00	Original	Tariq	01/13								
Rev.	Description	By	Mk/Yr	CENTRAL REGION BRANCH				<div><div>ABB</div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>	Design No.		Lang. EN Page 37 Pages 41

+D-F2

REF 615

REF 615 : BACK UP O/C +E/F RELAY

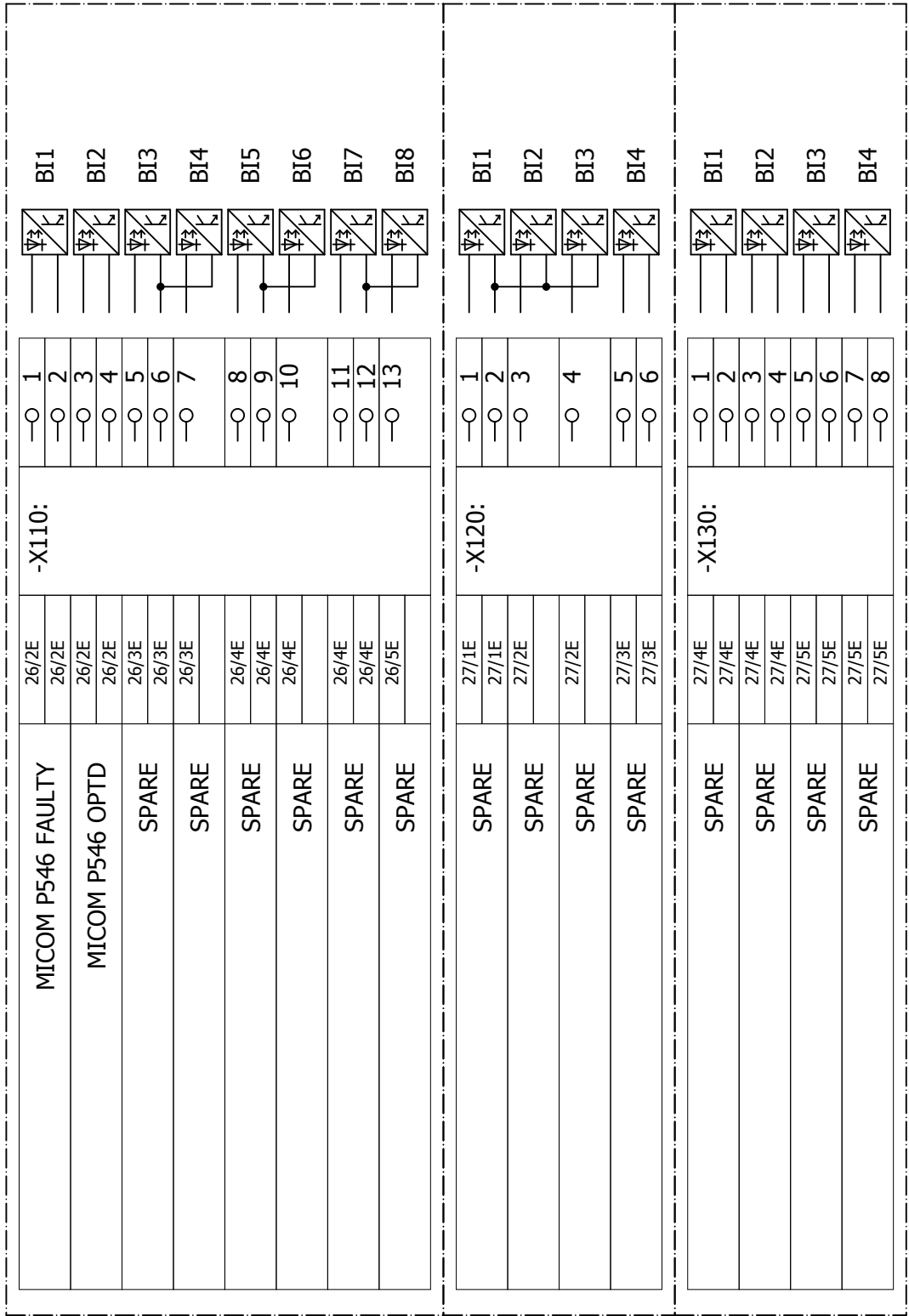


REF 615

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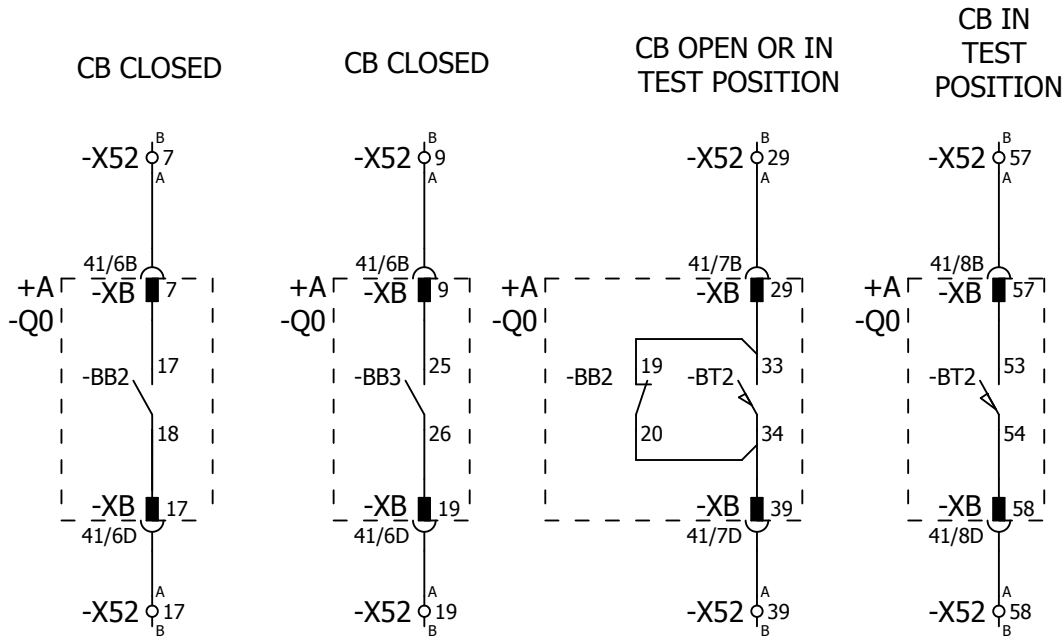
REF 615 : FEEDER PROTECTION AND CONTROL

REF 615



REF 615

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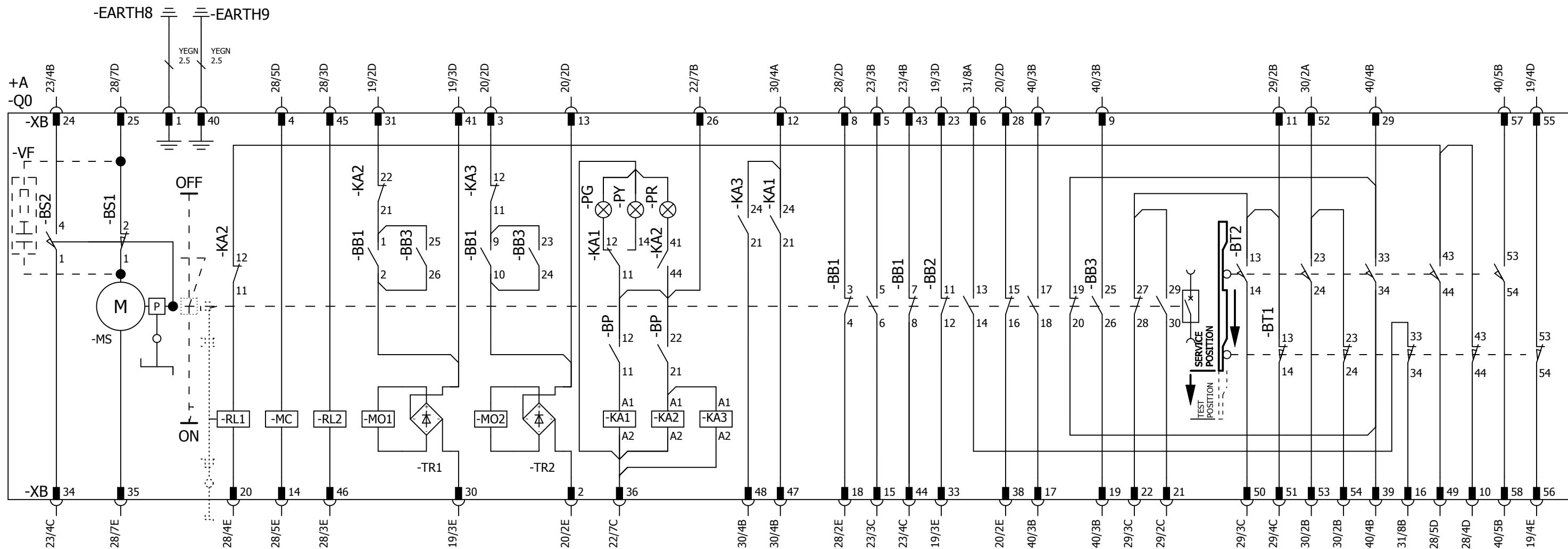
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					Checked Tariq	Approved S.Moin			+ E
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. CA-289327	Lang. EN
00	Original	Tariq	01/13						
Rev.	Description	By	Wk/Yr				Design No.	Pages 41	

HD4

DOC. No: 1VCZ400054

Figures: 1, 2, 3, 4, 7, 9, 14, 22, 32, 51



CB OPEN, TRUCK IN SERVICE POSITION, SPRING NOT CHARGED



SPARE TERMINALS

- X2 ϕ_{33}^B ϕ_{34}^B ϕ_{35}^B ϕ_{36}^B
- X3 ϕ_{12}^B ϕ_{13}^B
- X4 ϕ_{21}^B ϕ_{22}^B ϕ_{23}^B ϕ_{24}^B ϕ_{25}^B
- X5.1 ϕ_{86}^B ϕ_{87}^B ϕ_{88}^B ϕ_{89}^B ϕ_{90}^B ϕ_{91}^B ϕ_{92}^B ϕ_{93}^B ϕ_{94}^B ϕ_{95}^B ϕ_{96}^B ϕ_{97}^B ϕ_{98}^B ϕ_{99}^B
- X7 ϕ_{99}^B
- X7.1 ϕ_1^B ϕ_2^B ϕ_3^B ϕ_4^B ϕ_5^B ϕ_6^B ϕ_7^B ϕ_8^B ϕ_9^B
- X11 ϕ_{15}^B ϕ_{16}^B
- X12 ϕ_{15}^B ϕ_{16}^B
- X13 ϕ_{21}^B ϕ_{22}^B
- X14 ϕ_{12}^B ϕ_{13}^B
- X52 ϕ_{40}^B ϕ_{42}^B ϕ_{47}^B ϕ_{48}^B ϕ_{52}^B ϕ_1^B ϕ_{16}^B ϕ_{27}^B ϕ_{37}^B
- X87 ϕ_9^B ϕ_{10}^B

DESIGNAT.	FIGURE	DESCRIPTION	DESIGNAT.	FIGURE	DESCRIPTION
-MS	Fig.1	MOTOR FOR SPRING CHARGING	-PG	Fig.14	GREEN LED - NORMAL GAS PRESSURE
-BS1	Fig.1	CLOSING SPRINGS DISCHARGED	-PY	Fig.14	YELLOW LED - LOW GAS PRESSURE
-MC	Fig.2	SHUNT RELEASE ON	-PR	Fig.14	RED LED - INSUFFICIENT GAS PRESSURE
-RL1	Fig.3	BLOCKING MAGNET AGAINST CB CLOSING	-BS2	Fig.22	CLOSING SPRING CHARGED
-RL2	Fig.4	BLOCKING MAGNET AGAINST TRUCK MOVING			
-MO1	Fig.7	FIRST SHUNT RELEASE OFF	-BB1	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR1	Fig.7	RECTIFIER FOR COIL -MO1	-BB2	Fig.32	AUXILIARY SWITCH CB SHAFT
-MO2	Fig.9	SECOND SHUNT RELEASE OFF	-BB3	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR2	Fig.9	RECTIFIER FOR COIL -MO2	-BT1	Fig.51	CB TRUCK IN SERVICE (CONNECTED) POSITION
-KA1	Fig.14	AUX. RELAY - LOW GAS PRESSURE	-BT2	Fig.51	CB TRUCK IN TEST (ISOLATED) POSITION
-KA2	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XB		58-POLE PLUG FOR AUXILIARY CIRCUITS
-KA3	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XG		GROUND TERMINALS

				 الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (2075) HD4 INTERNAL WIRING	ABB Job No.	N106931.004	= AG20	
					Checked Tariq	Approved S.Moin				+ E	
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2		 ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289327	Lang.	EN
00	Original	Tariq	01/13								Design No.
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH						Pages	41

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CA-289320

P

C424

11131061/00

JOB ORDER / CONTRACT NO.

REV. NO.

DRAWING NUMBER

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0401
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 800A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE		DRAWING NO.
XXXXX		XXXXX
XXXXX		XXXXX


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AS-BUILT		BY	DATE			
01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin

REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء

National Grid

CENTRAL REGION BRANCH

DRAWN BY Tariq

CHECKED BY Tariq

DATE STARTED 30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED BY DATE

COVER SHEET

OUTGOING (OHL) FEEDER (1775)

132/33kV # S/S-8501

SAUDI ARABIA

ABB CUBICLE NO.	SEC CUBICLE NO.	EARTH SWITCH NO.
= AG17		

ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289320	1 of 38	00

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ABB ELECTRICAL INDUSTRIES CO. LTD.

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=AG17+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG17+E/3	Apparatus List	00	Original	01	As per comments				
=AG17+E/4	Terminal Block Schedule	00	Original	01	As per comments				
=AG17+E/5	Single Line Diagram	00	Original	01	As per comments				
=AG17+E/6	Cubicle Assembly	00	Original	01	As per comments				
=AG17+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG17+E/8	CT CORE1-LINE DISTANCE PROTECTION	00	Original	01	As per comments				
=AG17+E/9	CT CORE2-BACKUP O/C+E/F PROTECTION	00	Original	01	As per comments				
=AG17+E/10	CT CORE3-METERING	00	Original	01	As per comments				
=AG17+E/11	CT CORE4-87B PROTECTION	00	Original	01	As per comments				
=AG17+E/12	ES - INTERNAL WIRING	00	Original	01	As per comments				
=AG17+E/13	BUS VT SUPPLY TO MICOM P546 / REF 615	00	Original	01	As per comments				
=AG17+E/14	AC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG17+E/15	DC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG17+E/16	TRIP CIRCUIT-1 & SUPERVISION	00	Original	01	As per comments				
=AG17+E/17	TRIP CIRCUIT-2 & SUPERVISION	00	Original	01	As per comments				
=AG17+E/18	TRIP RELAY	00	Original	01	As per comments				
=AG17+E/19	CBF STAGE-2 LOCKOUT RELAY	00	Original	01	As per comments				
=AG17+E/20	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG17+E/21	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG17+E/22	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG17+E/23	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG17+E/24	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG17+E/25	CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	00	Original	01	As per comments				
=AG17+E/26	INDICATION CIRCUIT	00	Original	01	As per comments				
=AG17+E/27	CONTACTS TO SCADA INDICATION	00	Original	01	As per comments				
=AG17+E/28	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG17+E/29	SPARE CONTACTS	00	Original	01	As per comments				
=AG17+E/30	SPARE CONTACTS (MICOM P546/REF 615)	00	Original	01	As per comments				
=AG17+E/31	MiCOM P546 - ANALOGUE INPUTS	00	Original	01	As per comments				
=AG17+E/32	MiCOM P546 - COMMUNICATION PORTS	00	Original	01	As per comments				
=AG17+E/33	MiCOM P546 - DIGITAL INPUTS	00	Original	01	As per comments				
=AG17+E/34	MiCOM P546 - OUTPUTS	00	Original	01	As per comments				
=AG17+E/35	REF615 - A/I + Binary I/O Board	00	Original	01	As per comments				
=AG17+E/36	REF615 BINARY INPUTS	00	Original	01	As per comments				
=AG17+E/37	HD4 SPARE CONTACTS	00	Original	01	As per comments				
=AG17+E/38	HD4 INTERNAL WIRING	00	Original	01	As per comments				

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Item Number		Component number		Object description		Comp. Qty (CUn)									
+A-Q0		HD4-401225-125V		SF6 CB:HD4/Z40.12.25(FOR ZS3.2-125VDC		1									
+C-CT1-3		CT-N106931-33KVOHL		ABB EJF : TPU73.63 BIL:36/70/170kV, Frequency : 60Hz. Ambient temp: 40C Ith : 25kA (1 sec) IDYNAMIC/Peak :65kA (2.6 times the Ith as per IEC for 60hz). Thermal over current factor: 1.2 for single ratio Primary terminal silver plated. Secondary Reconnect able CORE 1- RATIO : 400-800/1A CLASS : 5P20 BURDEN : 22.5VA - 45VA Rct : 1 Ohm - 2 Ohms CORE 2- RATIO : 400-800/1A CLASS : 5P10 BURDEN : 15-30VA Rct : 1 Ohm - 2 Ohms CORE 3- RATIO : 400-800/1A CLASS : 0.2Fs5 BURDEN : 15-30VA CORE 4- RATIO : 2000/1A CLASS : PX Vkp : 350V Io : 30mA Rct : 5 Ohms		3									
								+D1-TS2		MV RK 926 115-BF		RELAY TEST SWITCH: RTXP18:RK 926 115-B		2	
								+D1-TS87B		MV RK 926 002-AD		RTXP8		1	
								+D-CVI		1YAB010028R0105		CVI(VOIS)36/40.5kV COMPLET W. INSULATORS		1	
								+D-F1		P54631NK6M0710M		P546-Current Differential with Distance		1	
								+D-F2		HBFJAEAGNEA1BAA1XE		REF615 -4I+5U-16BI+10BO+IEC61850		1	
								+D-F86CBF		MV-MVAJ105RA0802		Lockout Relay for CBF stage-2(8 NO + 2 NC)		1	
								+D-F94		MV-MVAJ101-RA-0802		MVAJ101 , (8 NO + 2 NC)		1	
								+D-H1		LED-125V-RESDIOD-R		LED48 -125VDC, Resistr+Diode22 DIA, RED		1	
								+D-H2		LED-125V-RESDIOD-G		LED48 -125VDC, Resistr+Diode22DIA, GREEN		1	
								+D-H3-4		LED-125V-RESDIOD-W		LED48-125VDC, Resistr+Diode 22 DIA,WHITE		2	
								+D-H5		LED-125V-RESDIOD-Y		LED48-125VDC, Resistor+Diode,22D,YELLOW		1	
								+D-P1		MV-V96LI-110-33KV		VOLTMETER, Type: V96LI-VT-A, 33000/110KV		1	
								+D-P2		MV-A96LI-1A-800-DS		AMMETER, Type : A96LI-CT-A, 800-400/1A		1	
								+D-P3		MV-M96D-1A-800-DS		MDI(built-in CT)Type: M96D_30,800-400/1A		1	
								+D-S1		CA10-A216-FUAP530		CB OPEN-NORMAL-CLOSE-Padlock.red handle		1	
								+D-S2		CA10-A223-FUAP531		BREAKER MODE SW. LOC/REM 20A 4P 2Positn		1	
								+D-S3		CA10-A260-FUAP534		Space heater SW "Off-Auto-Manual" (K&N)		1	
								+D-S4		CA10-A204-FUAP535		Lamp Test Switch (K&N)		1	
								+D-S5		CA10-A007-VMTR		Voltmeter Sel. Switch (K&N)		1	
								+D-S6		CHR10-A038-AMTR		Ammeter Selector Switch (K&N)		1	
								+D-S79		CA10-A223-FUAP572		A/R IN-OUT SEL. SWITCH (K&N)		1	
								+D-S86		MV-1SFA616100R4076		PB Black 1NO+1NC-22 dia-1SFA611100R4076		1	
								+D-TSM		MV-129A514G01		FT-1 SW-FOR METERING CT/VT ISOL.(6C+4P)		1	
								+E-E2		DMS 3110		THERMOSTAT 24,48,60,115 & 230V		1	
								+E-E4		MV 5911 0818-01		FLUORESCENT LAMP WITH DIFFUSER, 120VAC		2	
								+E-EC		GCE0990162P0101		PANEL HEATER 240V,50W-Boxin-3Met.Cable		1	
								+E-F11-15		MV-S 282 UC-K6		MCB 6A DC -2P		5	
								+E-F16-17		MV-S 202-K6		MCB 2 POLE 6A -AC		2	
								+E-F20-21		MV-S 203-K10		MCB 3 Pole 10 Amp.		2	
								+E-F22-27		MV-S 203-K4		MCB -3POLE-4A -AC		6	
										MV-S 202-K4		MCB -2POLE-4A -AC		1	
										VT-GUARD-100-200V		VT OPEN DELTA RESISTOR UNIT >= 13.8KV		1	
										MV-S2C-H11L		.Ux contact 1NO+1NC AC -MCB		2	
										MV-S2-H11		Aux contact for DC MCB 1No+1NC		5	
										MV-RK 927 004-AB		COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C		1	
										DMS 924 0004		COMBIFLEX TERMINAL BASE RX 2H (4U 6C)		1	
										DMS 924 0002		COMBIFLEX TERMINAL BASE RX4 (4U 12C)		1	
												Highlighted components to be supplied as loose items			

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TERMINALS

NAME	TYPE	REMARK	QUANTITY	FUNCTION
X3	USST4		13	CONTROL CIRCUIT
X4	USST4		25	CONTROL CIRCUIT
X5	USST4		97	CONTROL CIRCUIT
X5.1	USST4		99	CONTROL CIRCUIT
X7	WTR-4SL		97	SCADA CIRCUIT
X7.1	WTR-4SL		9	SCADA CIRCUIT
X11	OTTA6-T-P/P		16	CT CIRCUIT
X12	OTTA6-T-P/P		16	CT CIRCUIT
X13	OTTA6-T-P/P		22	CT CIRCUIT
X14	OTTA6-T-P/P		13	CT CIRCUIT
X52	USST4		53	CB CIRCUIT
X87	OTTA6-T-P/P		10	CT CIRCUIT
X2	WTL6SL		10	VT CIRCUIT

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As per comments

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14/13

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National Grid SA

CENTRAL REGION BRANCH

Prepared Tariq

Date 30.12.2012

Checked Tariq

Approved S.Moin

Project name

132/33kV # S/S-8501
ZS3.2

Title

OUTGOING (OHL) FEEDER (1775)
Terminal Block Schedule


 ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.

N106931.004

Drg. No.

CA-289320

Design No.

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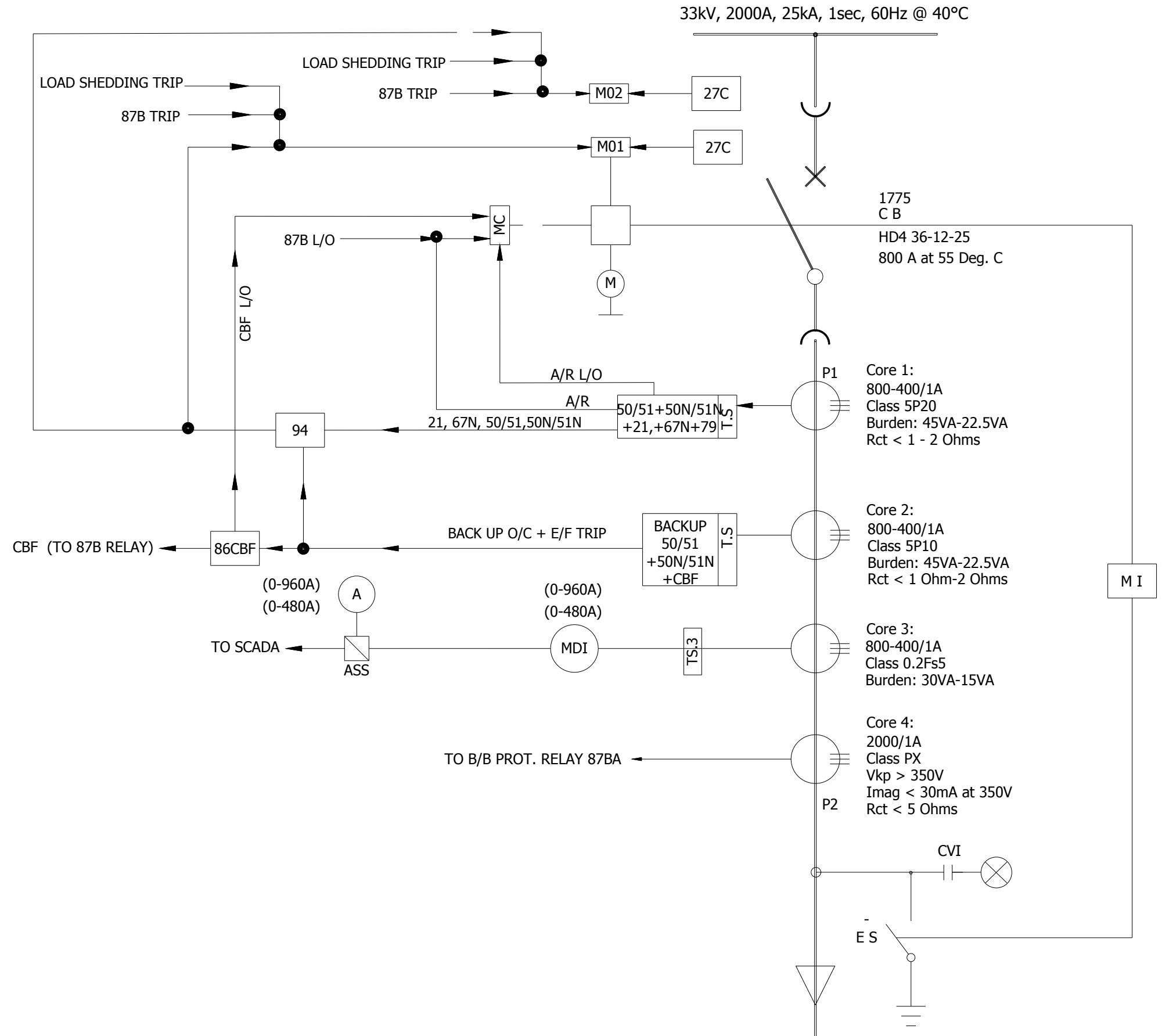
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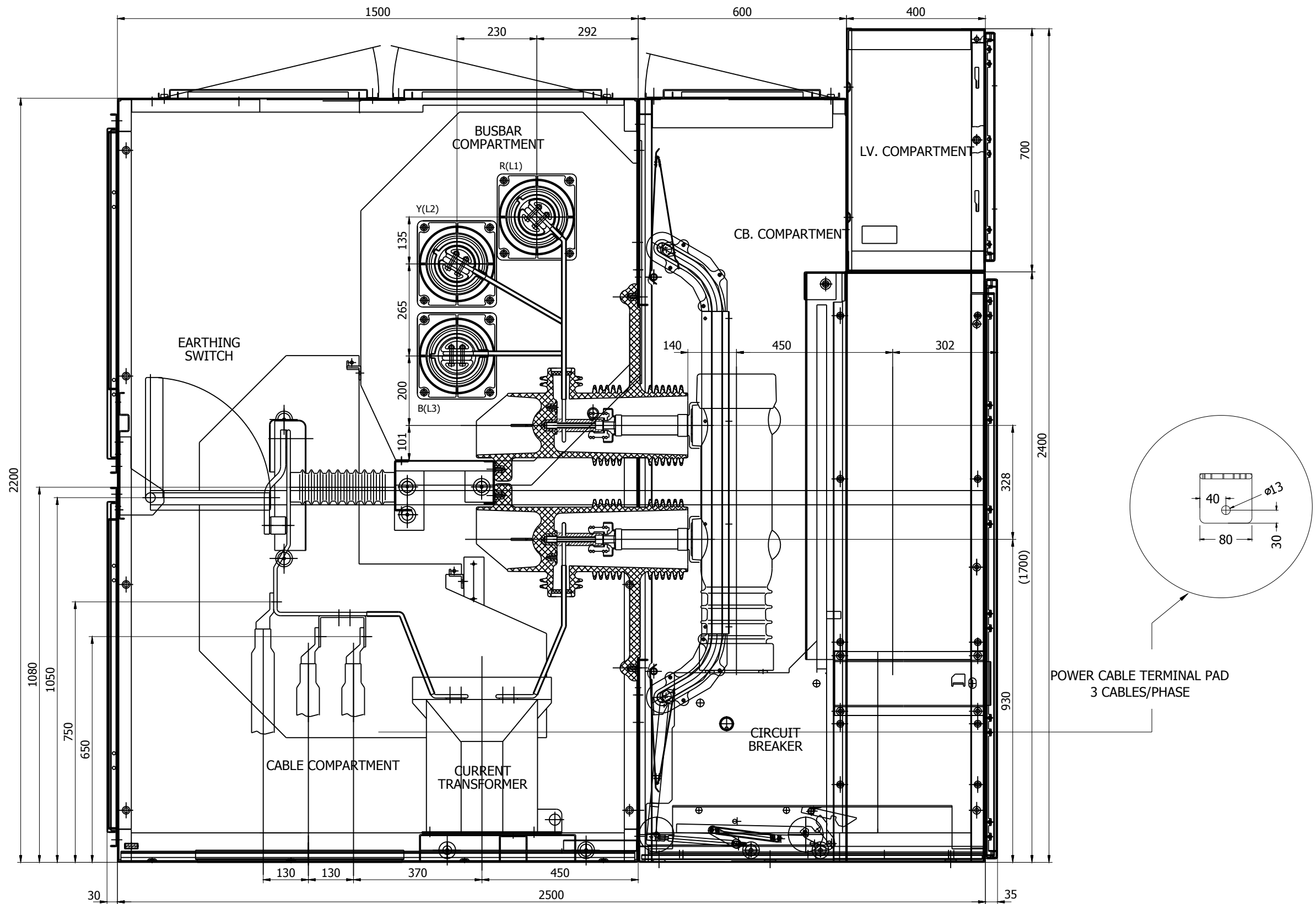
- 50/51 - Line Distance protection relay, Type: MICOM P546
+50N/51N With Directional E/F prot. and autorecloser
+21+67N+79
- 51/51N - Over current & Earth fault relay, Type: REF 615
- 94 - Trip Relay, type: MVAJ101
- 86CBF - CBF Stage-2 Lockout relay, type: MVAJ105
- 27C - Trip circuit supervision relay, Type: SPER 1C1
with No-Volt flag indication relay, Type: RXSF1
- T.S - Relay test block, type : RTXP24
- C.T. - Current Transformer

- A - Ammeter, 96X96 Long scale, Class 1.5
- MDI - Maximum demand indicator, 96x96
quadrant scale, Class 3, , Time lag= 30min.
- ASS - Ammeter selector switch, 4-position

- M01,M01 - Tripping coil
- MC - Closing coil
- E S - Earthing switch
- C B - Circuit Breaker
- CVI - Capacitive Voltage Indicator
- M I - Mechanical interlock
- M - CB charging motor



				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING (OHL) FEEDER (1775) Single Line Diagram	ABB Job No.	N106931.004	= AG17
					Checked Tariq	Approved S.Moin				+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Drg. No.	CA-289320
00	Original	Tariq	01/13							
Rev.	Description	By	Wk/Yr		CENTRAL REGION BRANCH		<div><div>ABB</div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>	Design No.		Pages 38



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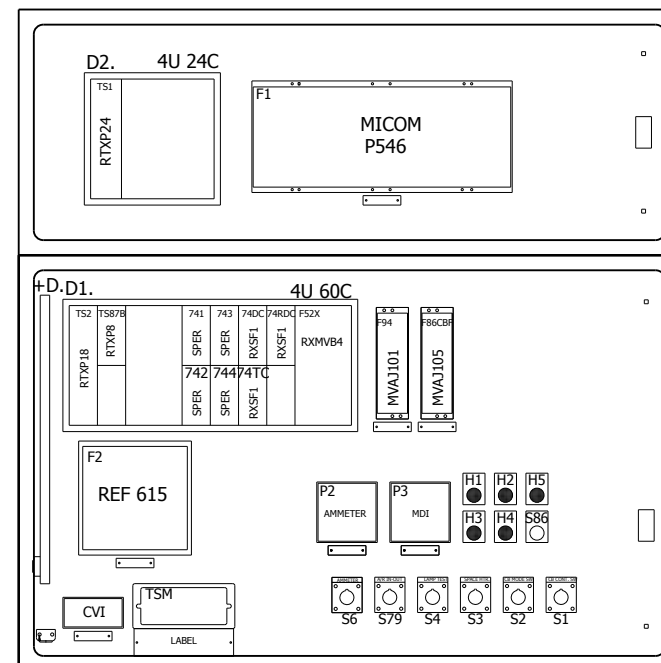
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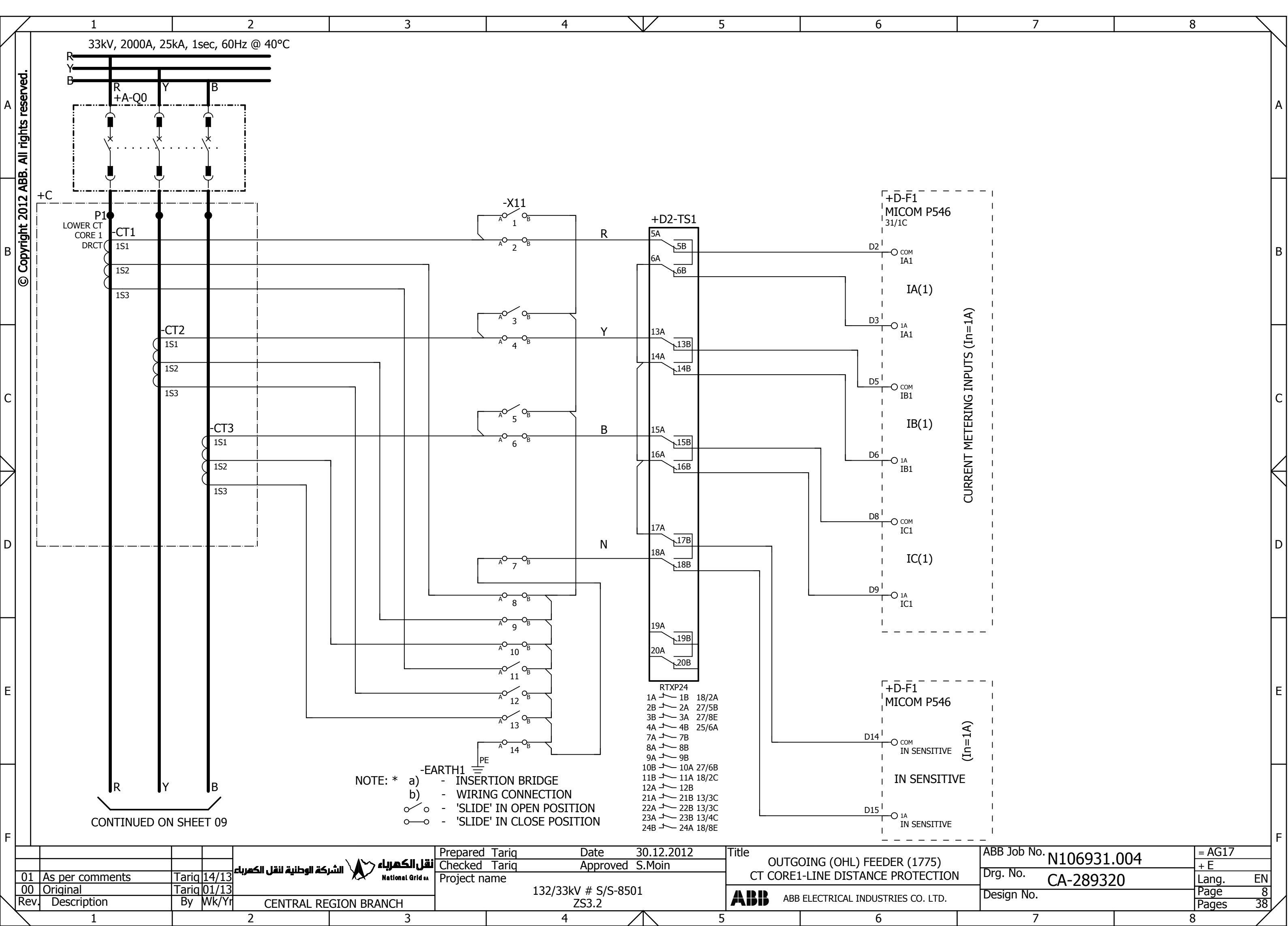
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Prepared Tariq	Date 30.12.2012
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Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (1775) Cubicle Assembly
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG17
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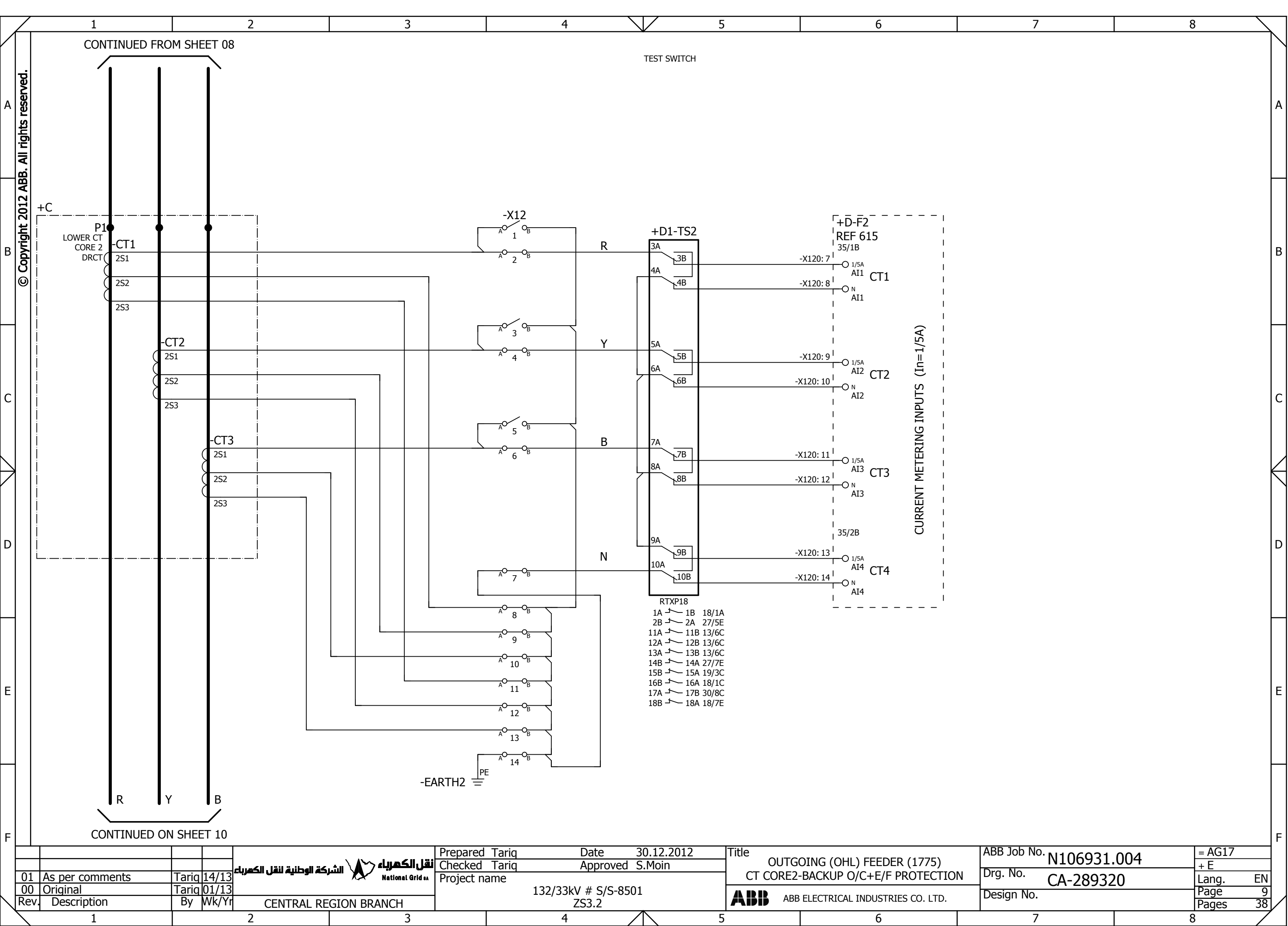
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Rev.	Description	By	Wk/Yr
			CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (1775) CT CORE1-LINE DISTANCE PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG17
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National Grid SA

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Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

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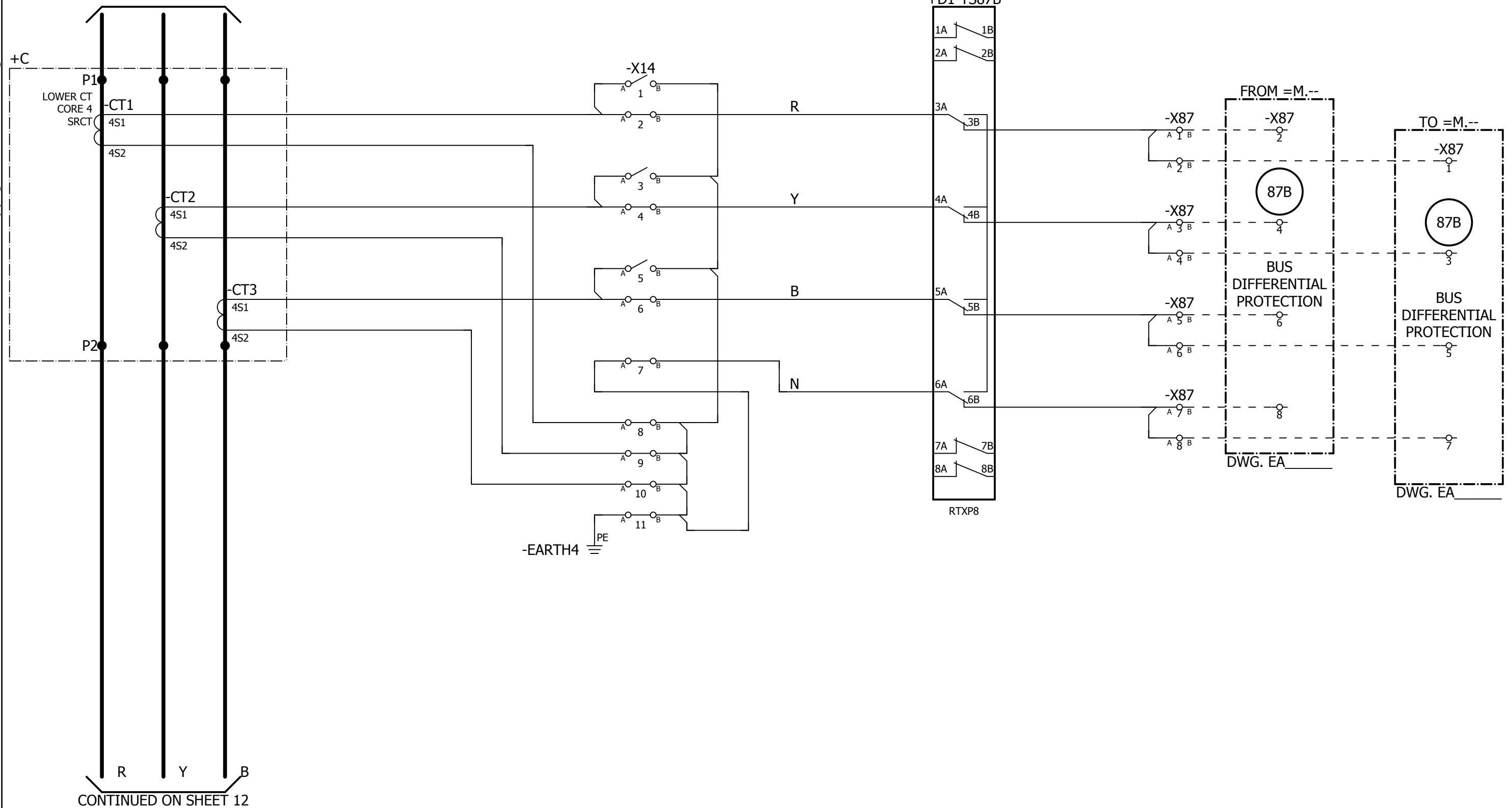
ABB ELECTRICAL INDUSTRIES CO. LTD.

OUTGOING (OHL) FEEDER (1775)
CT CORE2-BACKUP O/C+E/F PROTECTION

ABB Job No.	N106931.004	= AG17
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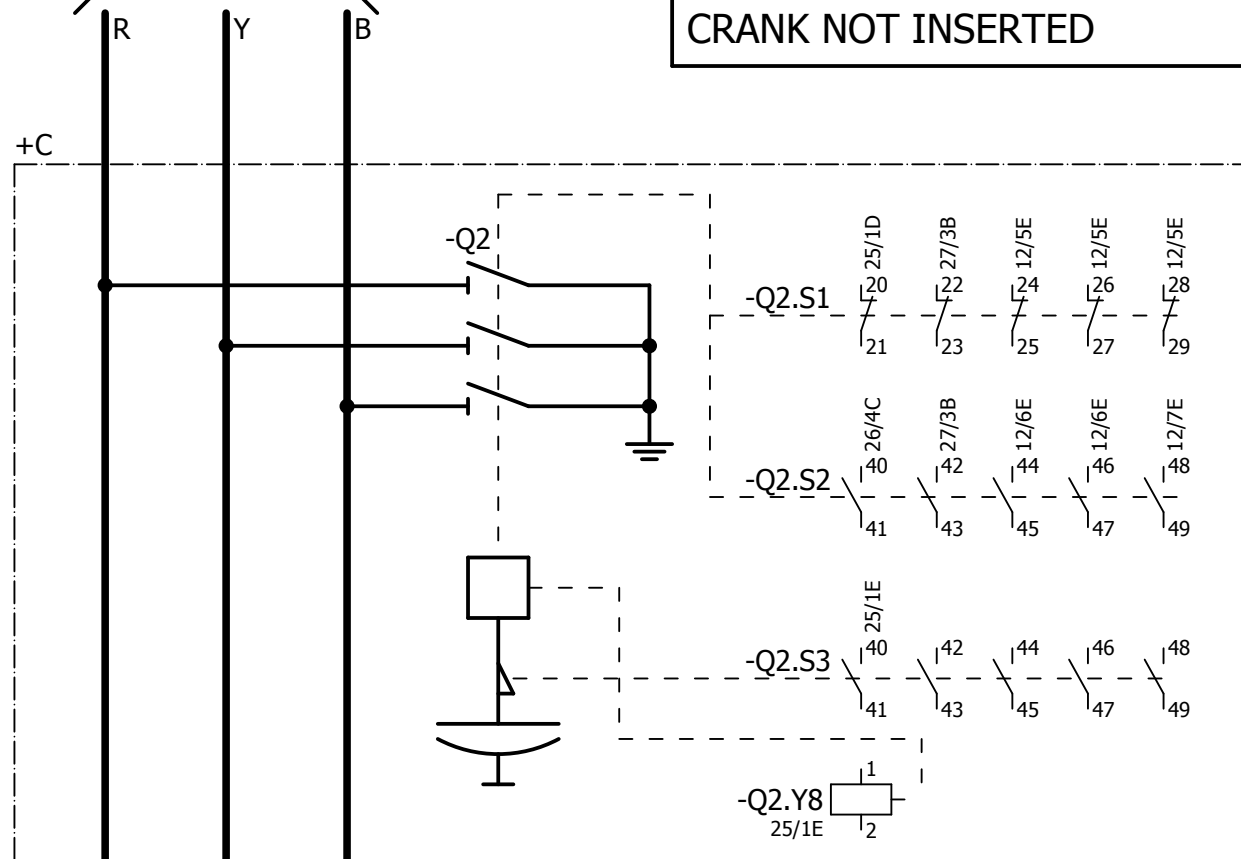
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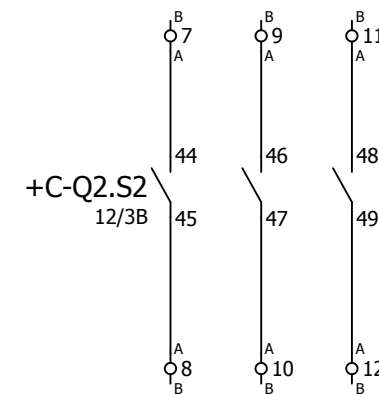
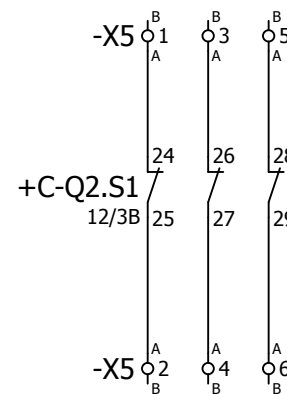
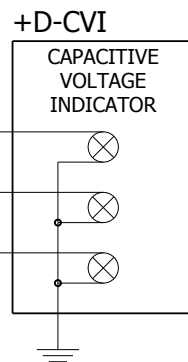
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					Checked Tariq	Approved	S.Moin					
01	As per comments	Tariq	14/13		Project name							
00	Original	Tariq	01/13		132/33kV # S/S-8501 ZS3.2			<div><div><div></div><div>ABB</div></div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>		Design No.	CA-289320	Lang. EN Page 11 Pages 38
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH								

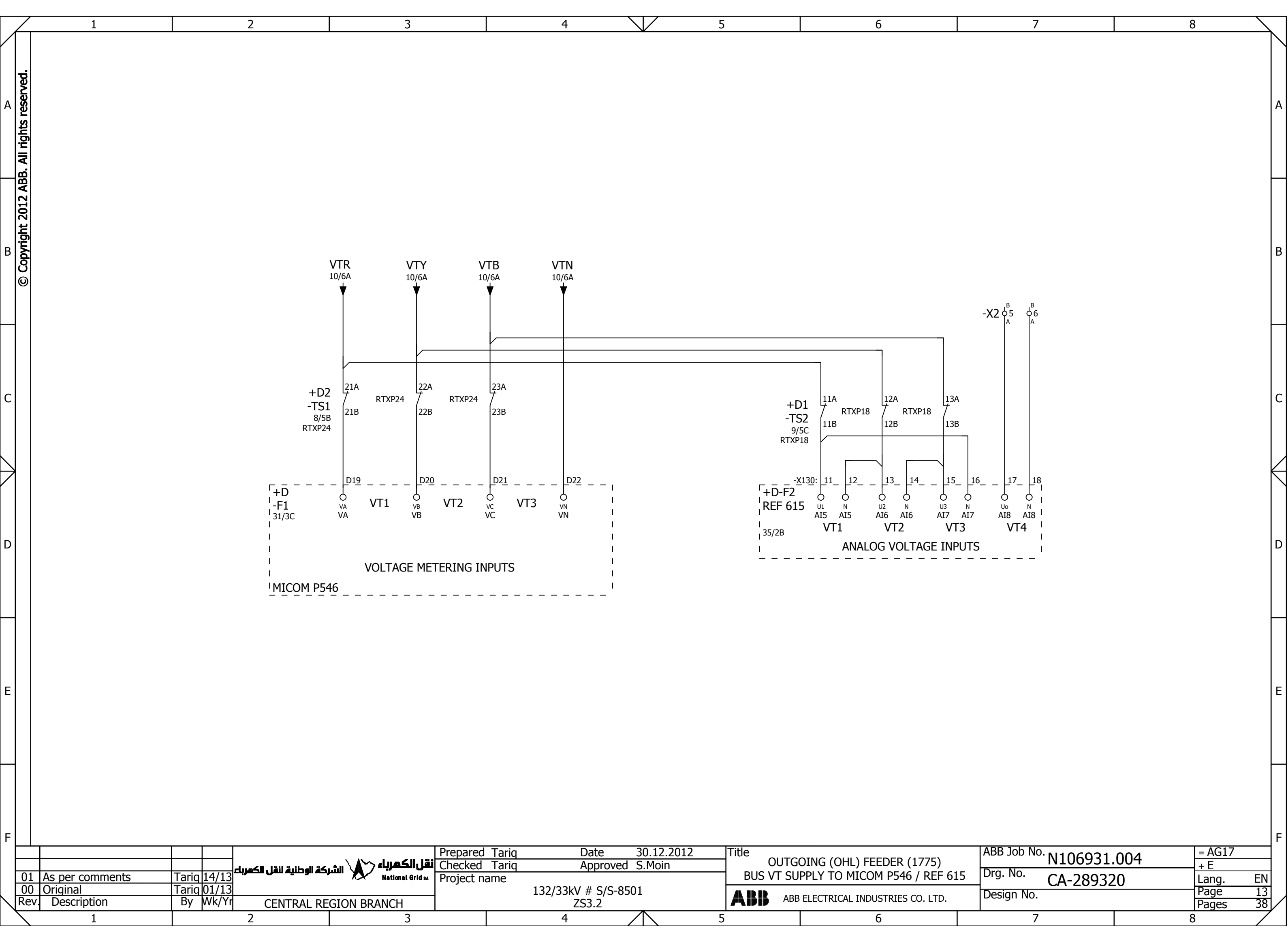
CONTINUED FROM SHEET 12

EARTHING SWITCH OFF AND CRANK NOT INSERTED



DESIGNATION	DESCRIPTION
-Q2.S1	EARTHING SWITCH OFF AND CRANK NOT INSERTED
-Q2.S2	EARTHING SWITCH ON
-Q2.S3	CRANK INSERTED
-Q2.Y8	EARTHING SWITCH BLOCKING COIL







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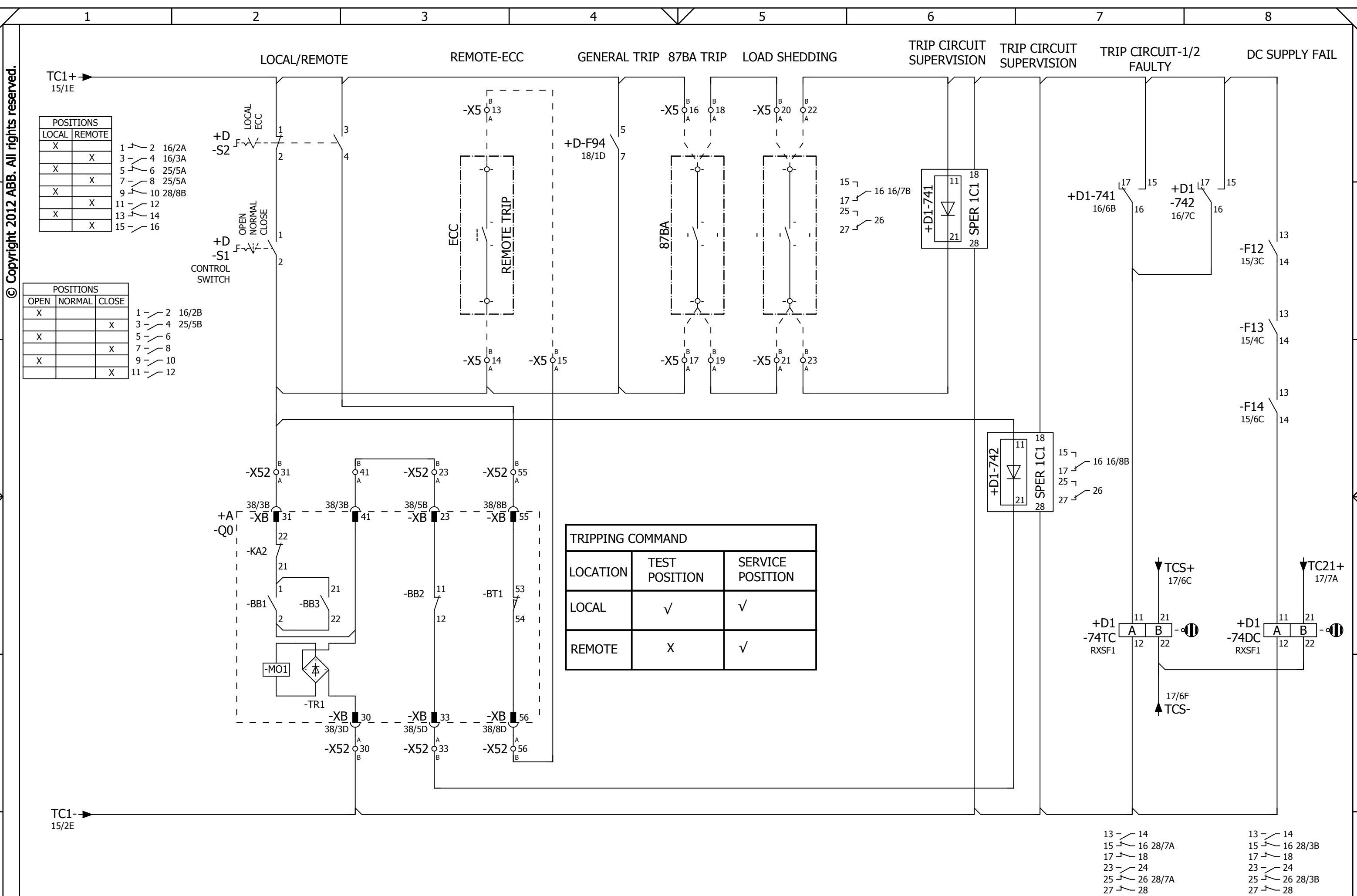
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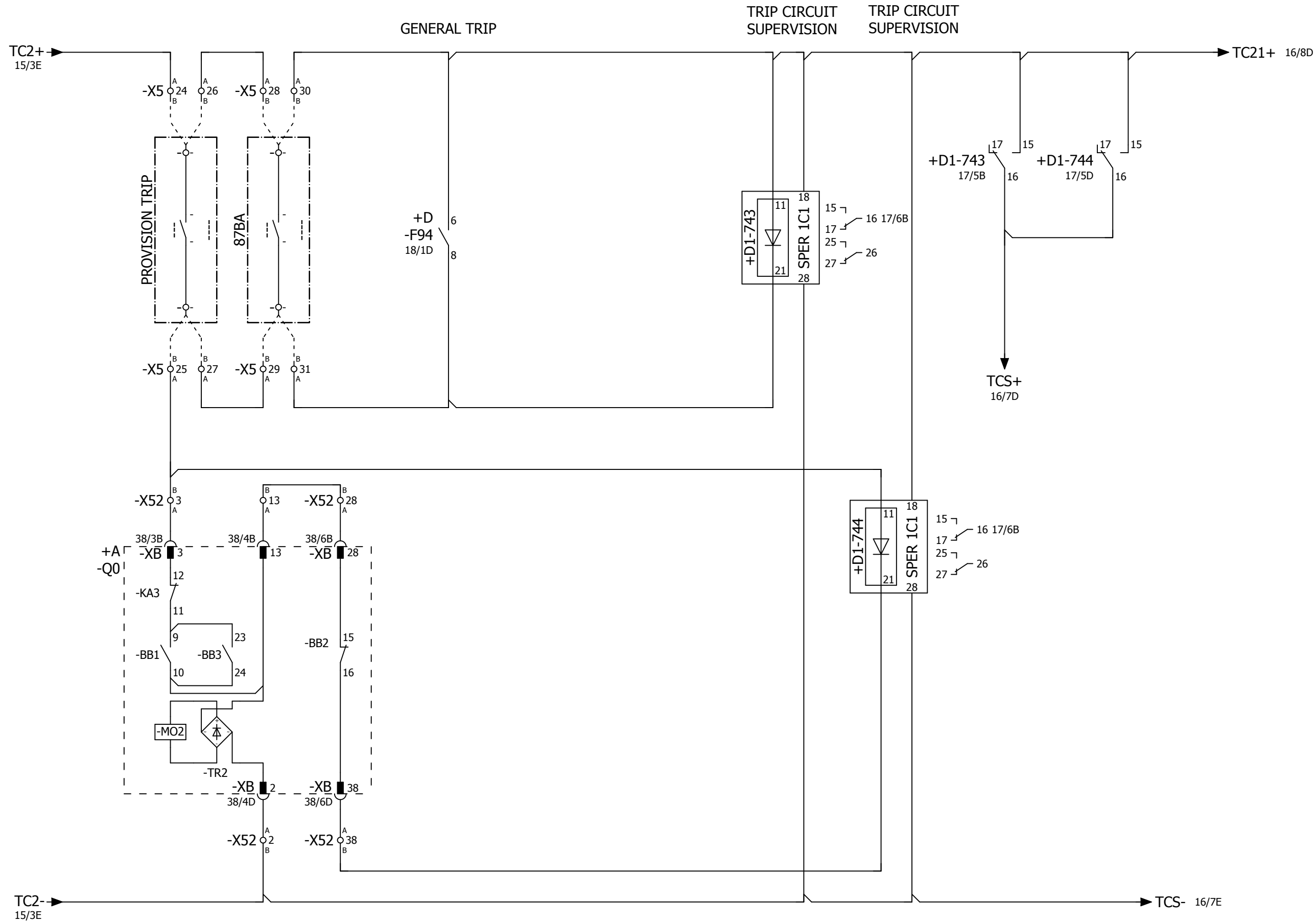
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					Checked Tariq	Approved S.Moin				+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Drg. No.	CA-289320
00	Original	Tariq	01/13							
Rev.	Description	By	Mk/Yr		CENTRAL REGION BRANCH			<div><div>ABB</div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>	Design No.	



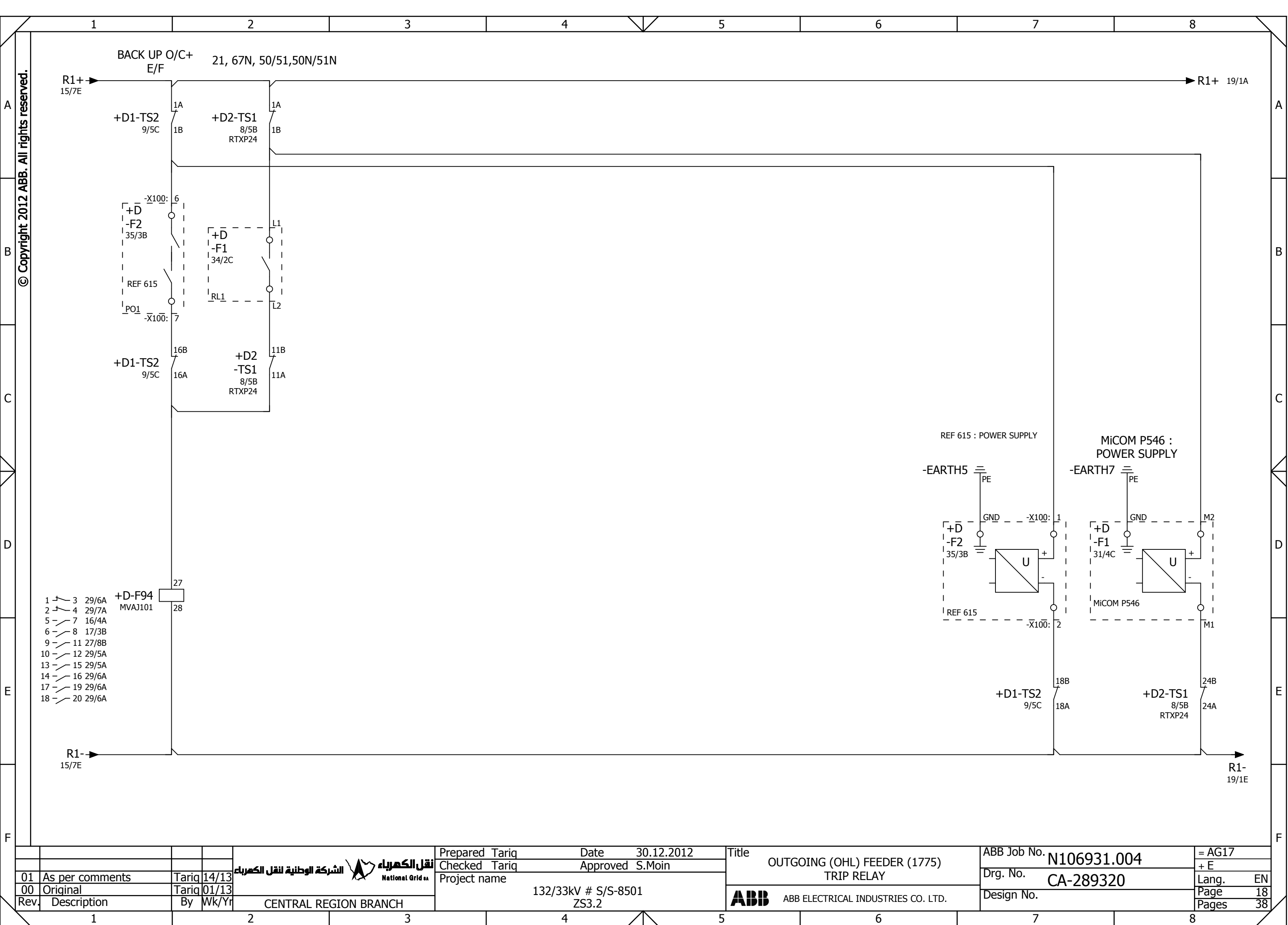
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Rev.	Description	By	Wk/Yr

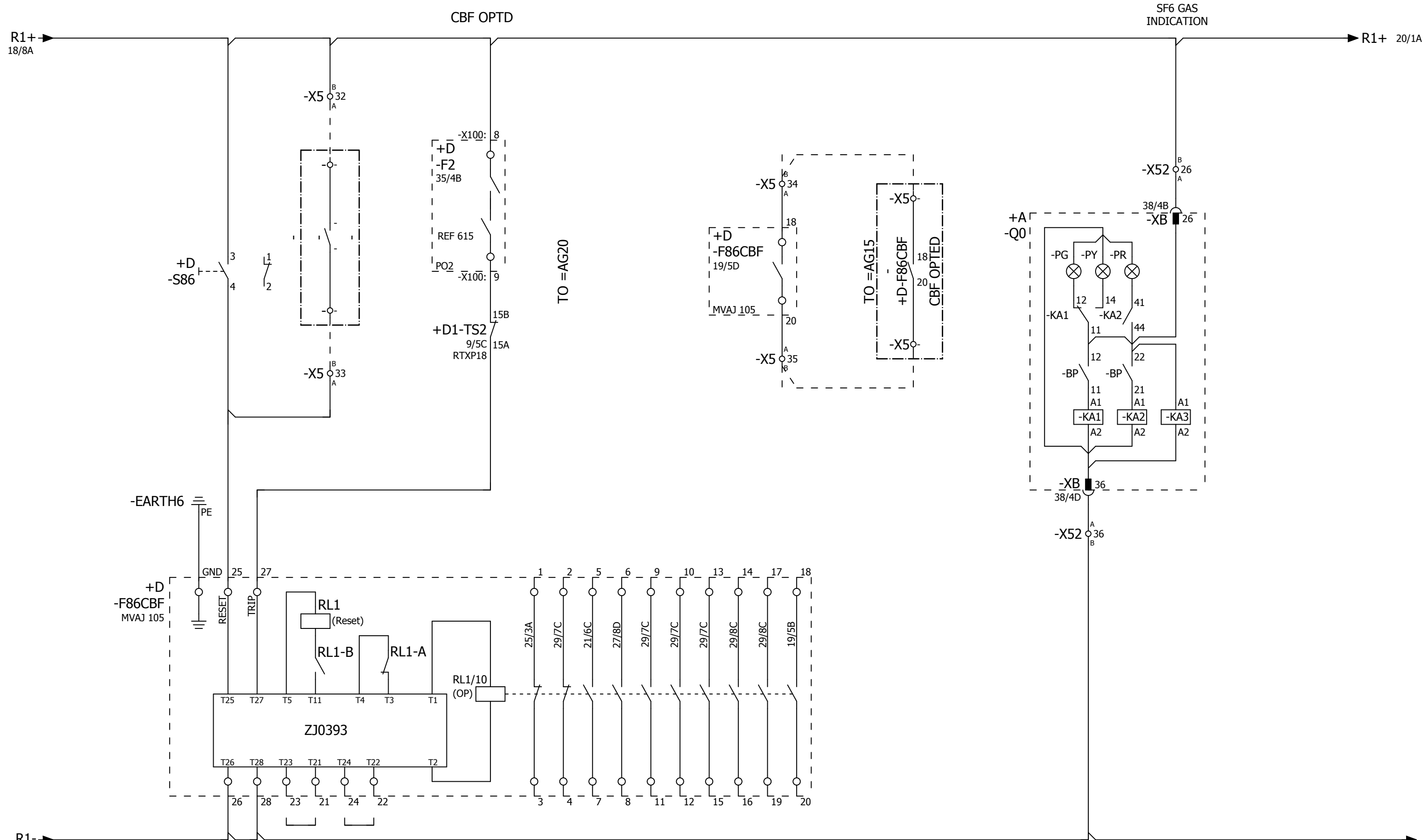
الشركة الوطنية لنقل الكهرباء
National Grid sa
CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING (OHL) FEEDER (1775) TRIP CIRCUIT-2 & SUPERVISION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG17
Drg. No.	CA-289320	+ E
Design No.		Lang. EN
		Page 17
		Pages 38






(NOTE 2)

(NOTE 1)

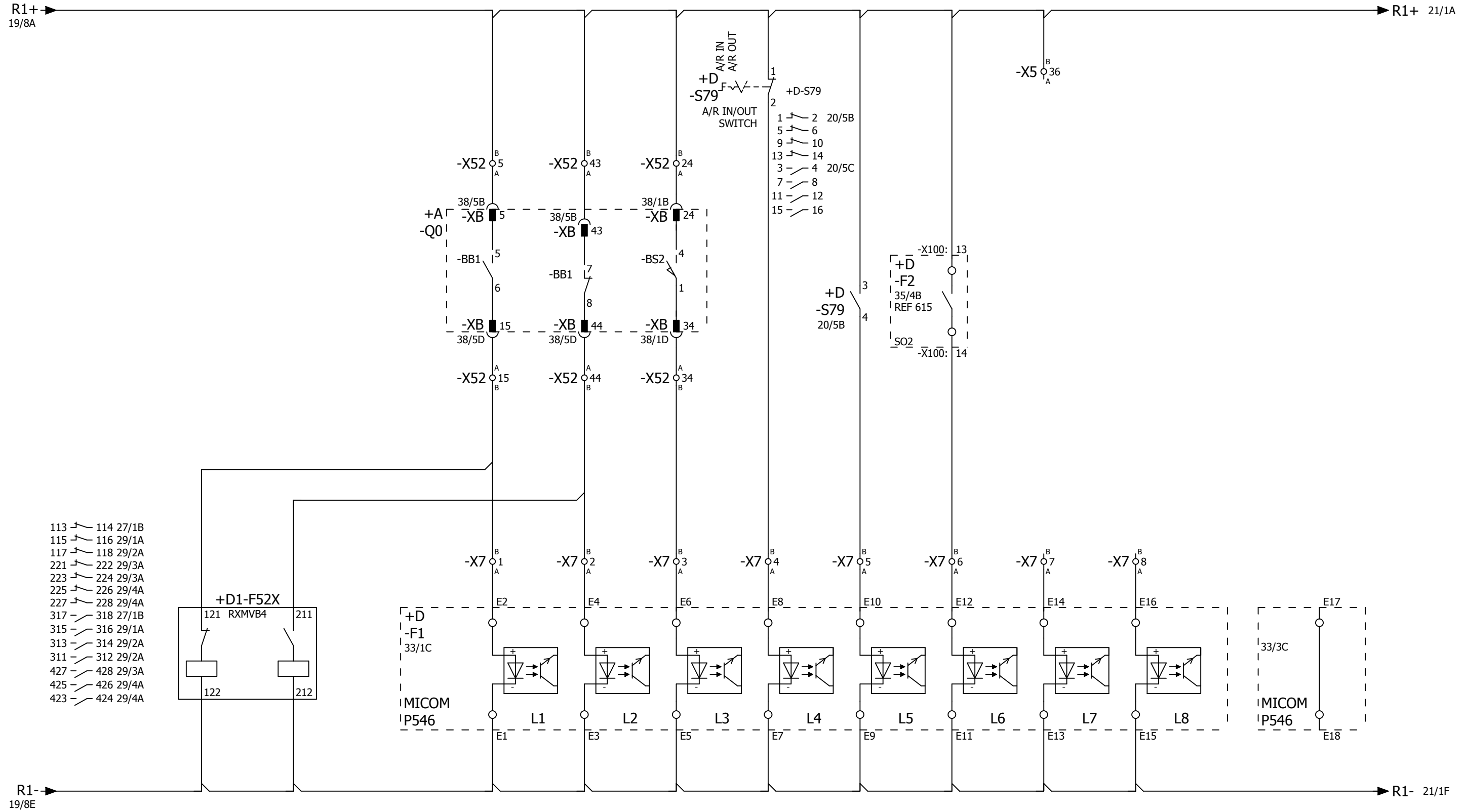
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LINK IN FOR HIGH BURDEN AS SUPPLIED
LINK OUT FOR LOW BURDEN

NOTE 2:
LINK TO ENABLE RESET INHIBITOR/ECONOMISING COIL

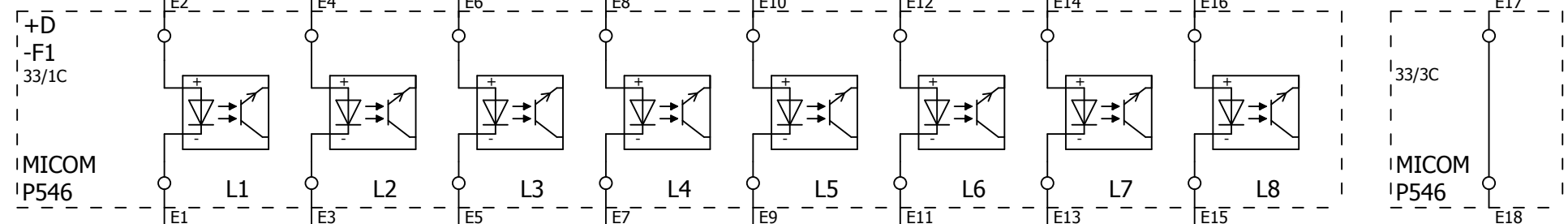
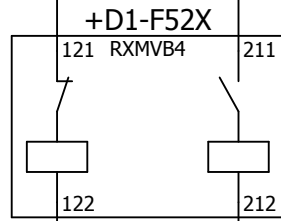
				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING (OHL) FEEDER (1775) CBF STAGE-2 LOCKOUT RELAY	ABB Job No. N106931.004	= AG17	
					Checked Tariq	Approved S.Moin		<div>ABB</div> ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. CA-289320	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Design No.	Lang. EN
00	Original	Tariq	01/13							
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Page 19	
								Pages 38		

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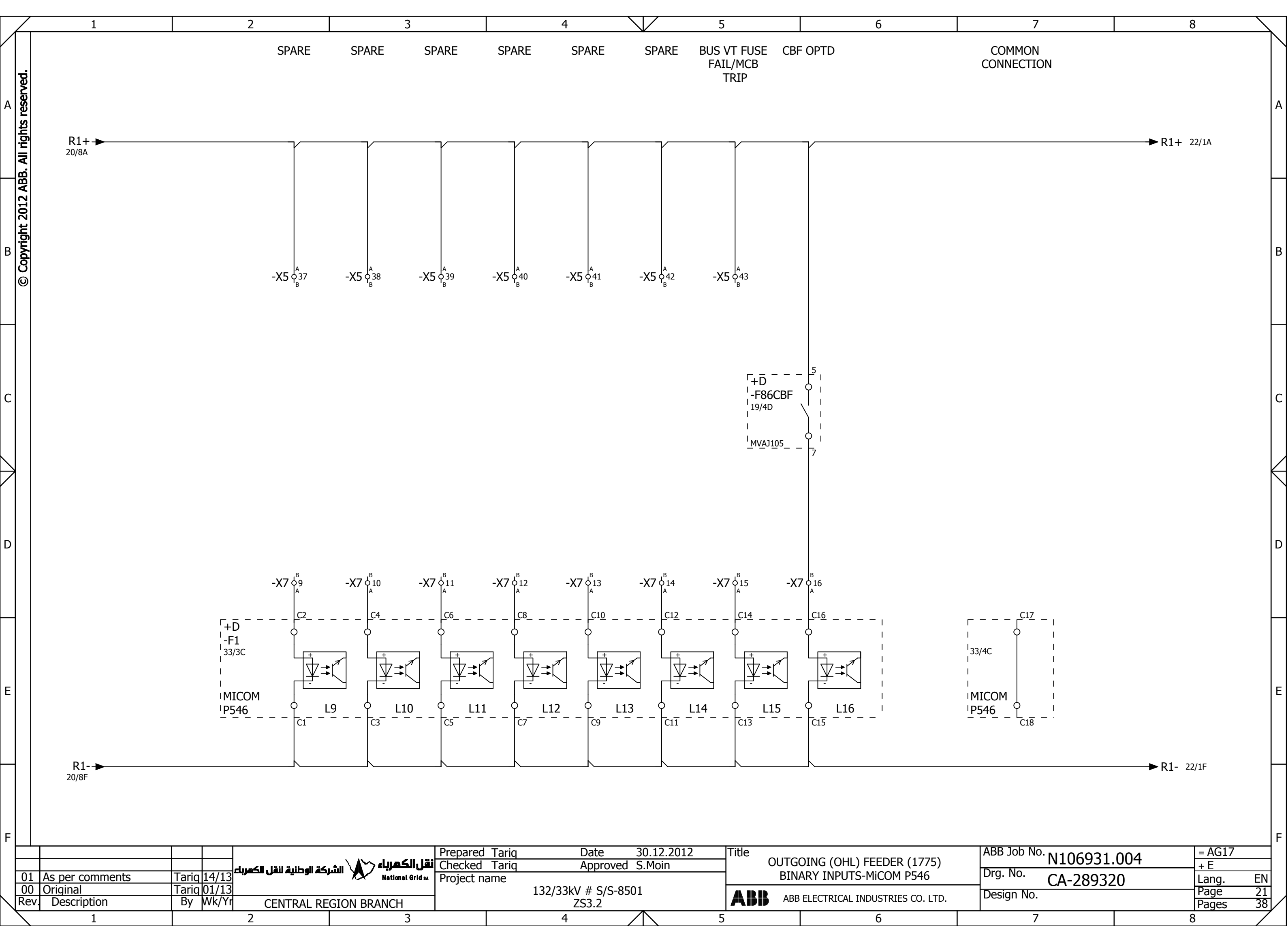
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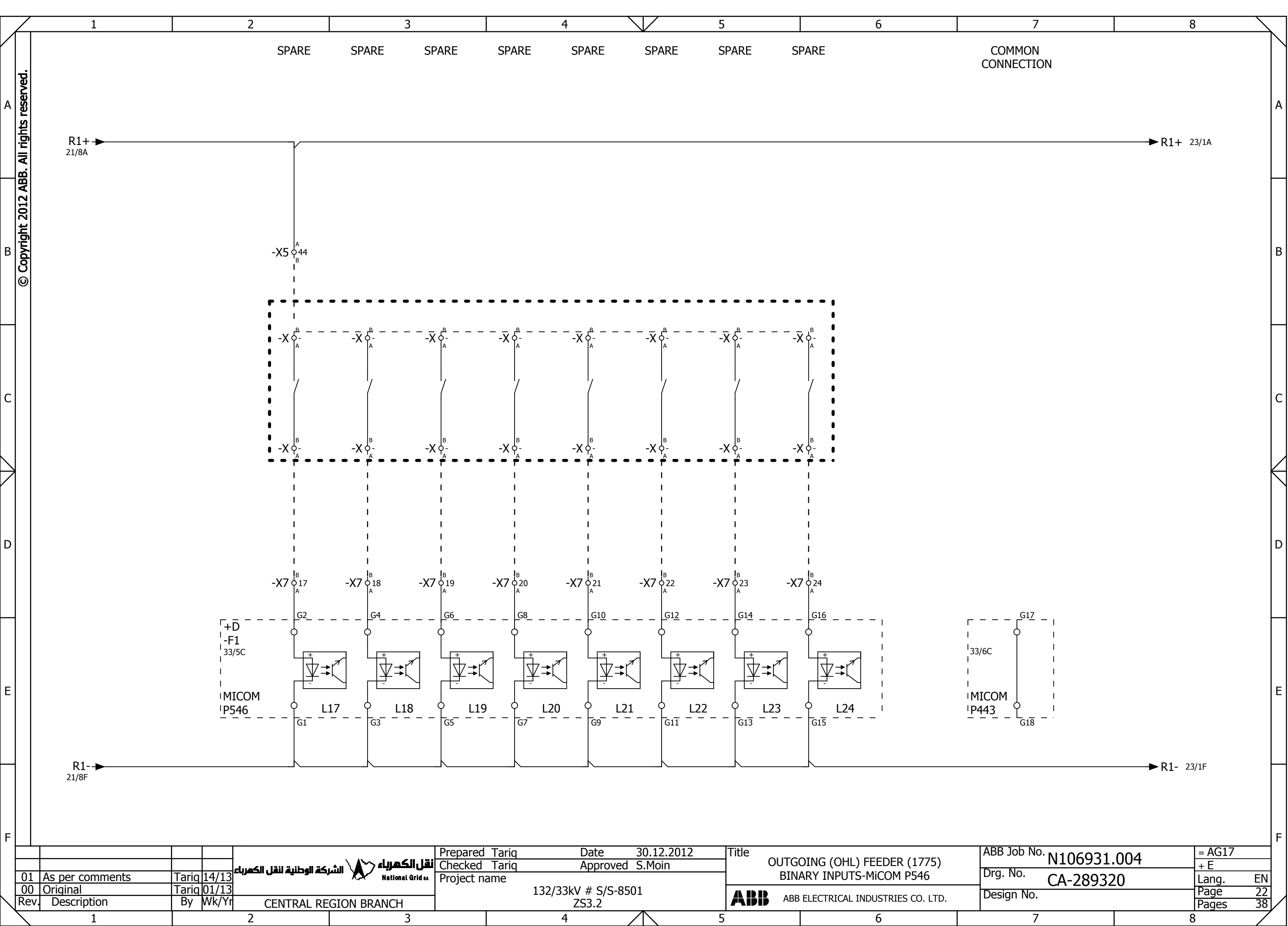


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- 115 116 29/1A
- 117 118 29/2A
- 221 222 29/3A
- 223 224 29/3A
- 225 226 29/4A
- 227 228 29/4A
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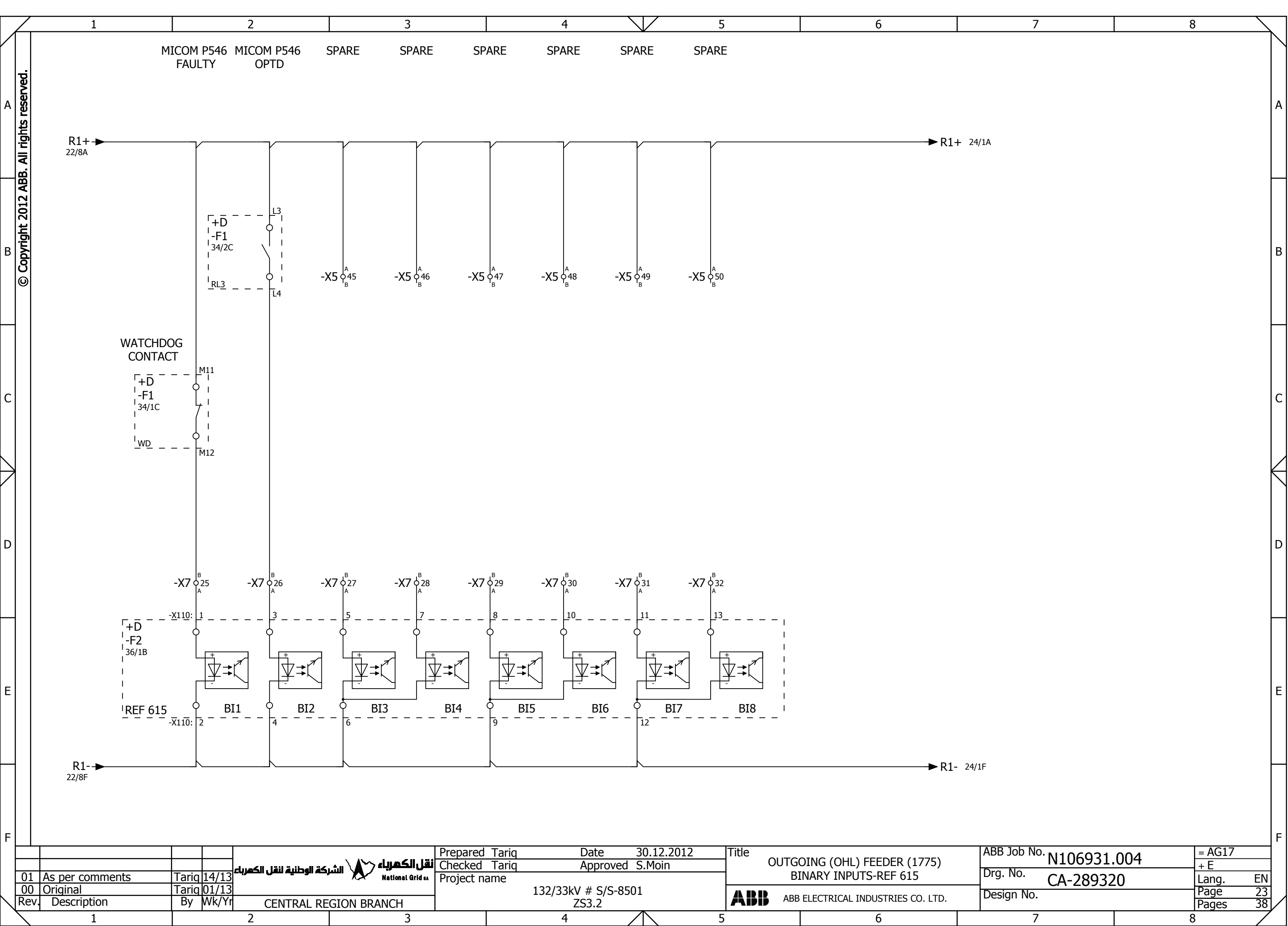


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01 As per comments		Tariq 14/13		Project name		132/33kV # S/S-8501 ZS3.2		Design No.		Lang. EN
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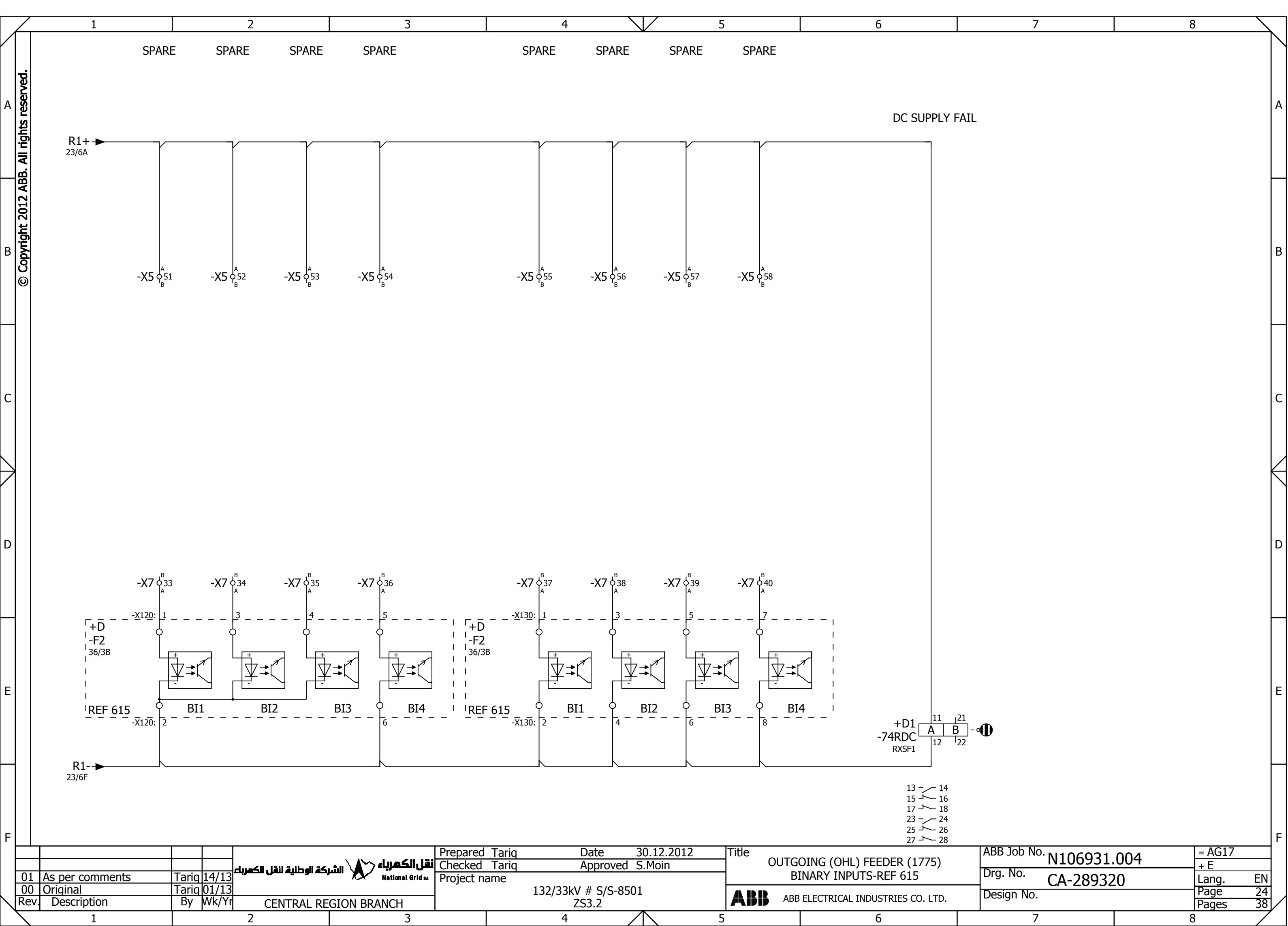
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Rev.	Description	By	Wk/Yr	

CENTRAL REGION BRANCH

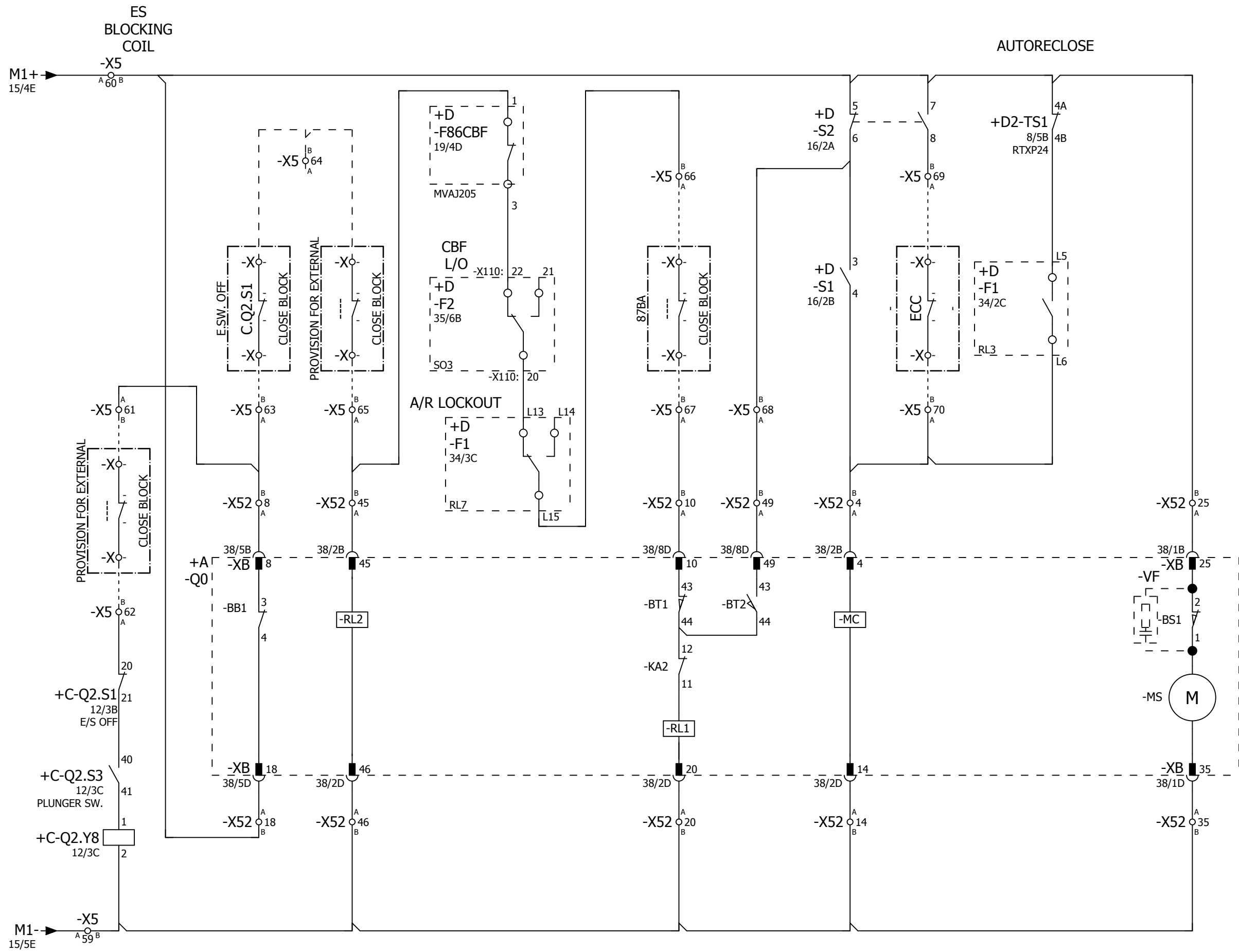
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Checked Tariq	Approved S.Moin
Project name	
132/33kV # S/S-8501	
ZS3.2	


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	BINARY INPUTS-REF 615
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

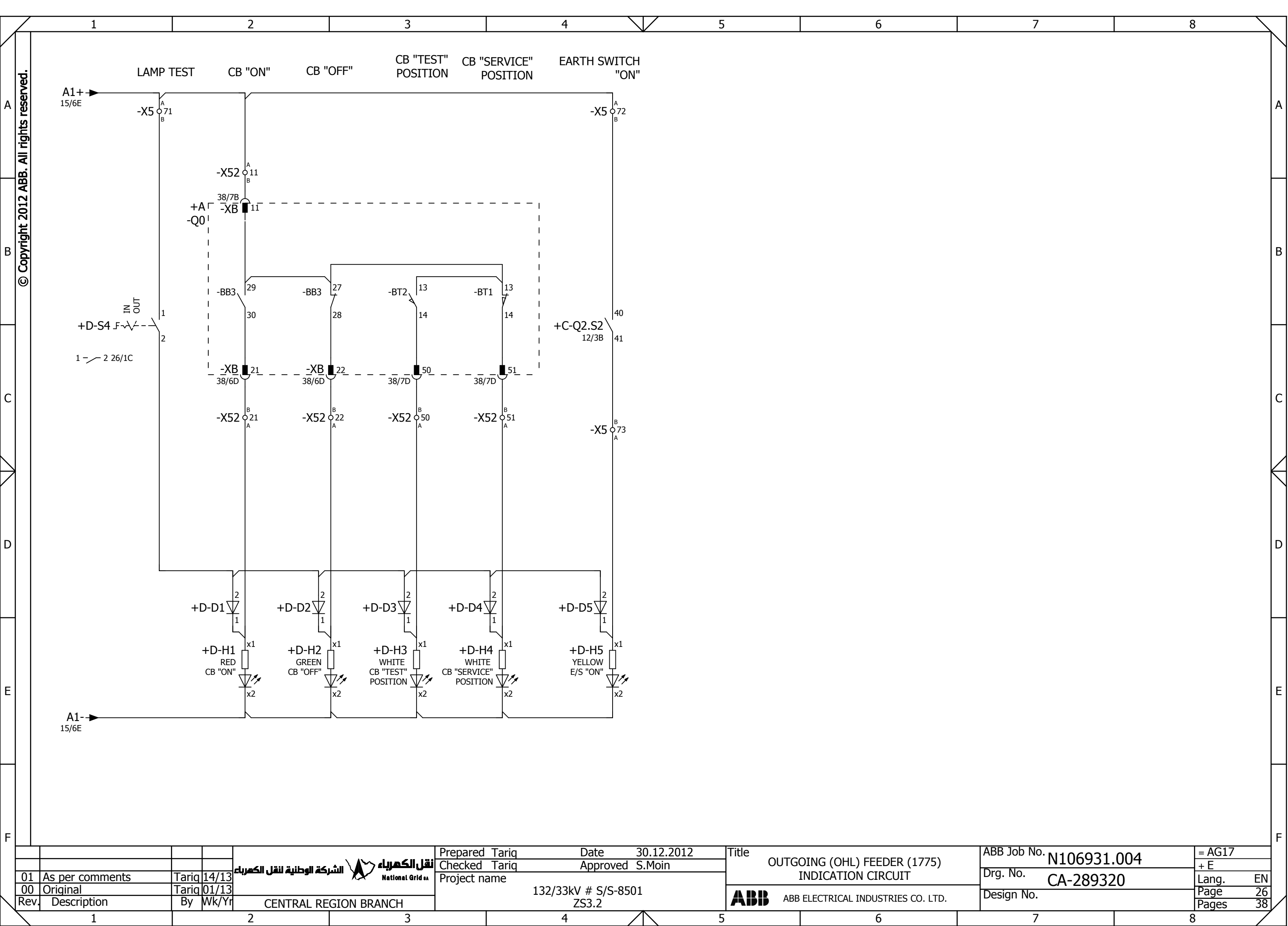
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Drg. No.	CA-289320	+ E
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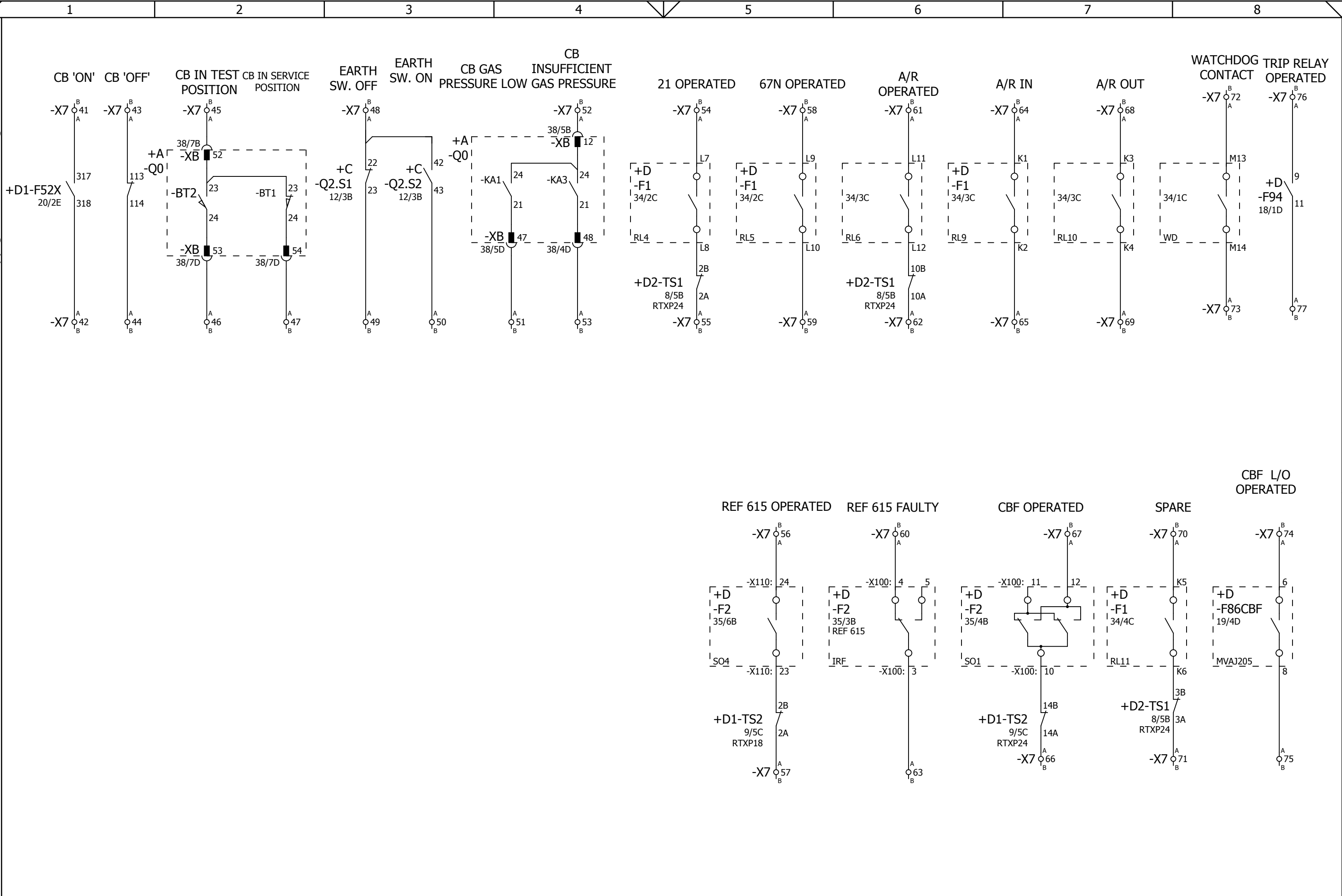
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				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING (OHL) FEEDER (1775) CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	ABB Job No.	N106931.004	= AG17 + E		
					Checked Tariq	Approved	S.Moin							
01 As per comments					Tariq	14/13	Project name	132/33kV # S/S-8501 ZS3.2	ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289320	Lang.	EN
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Rev. Description					By	Wk/Yr								
CENTRAL REGION BRANCH														

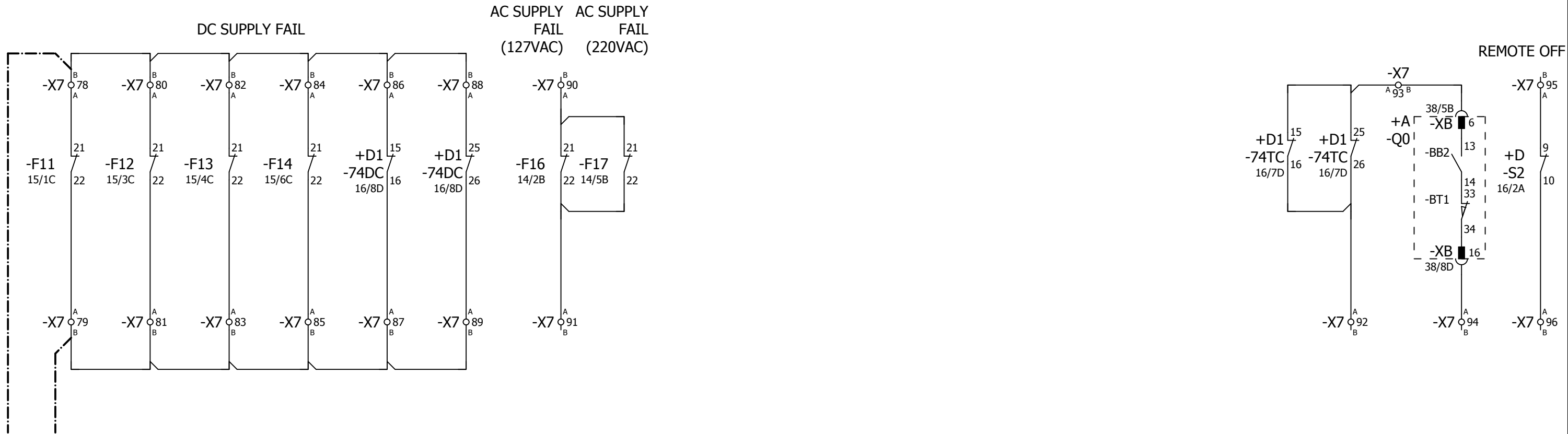



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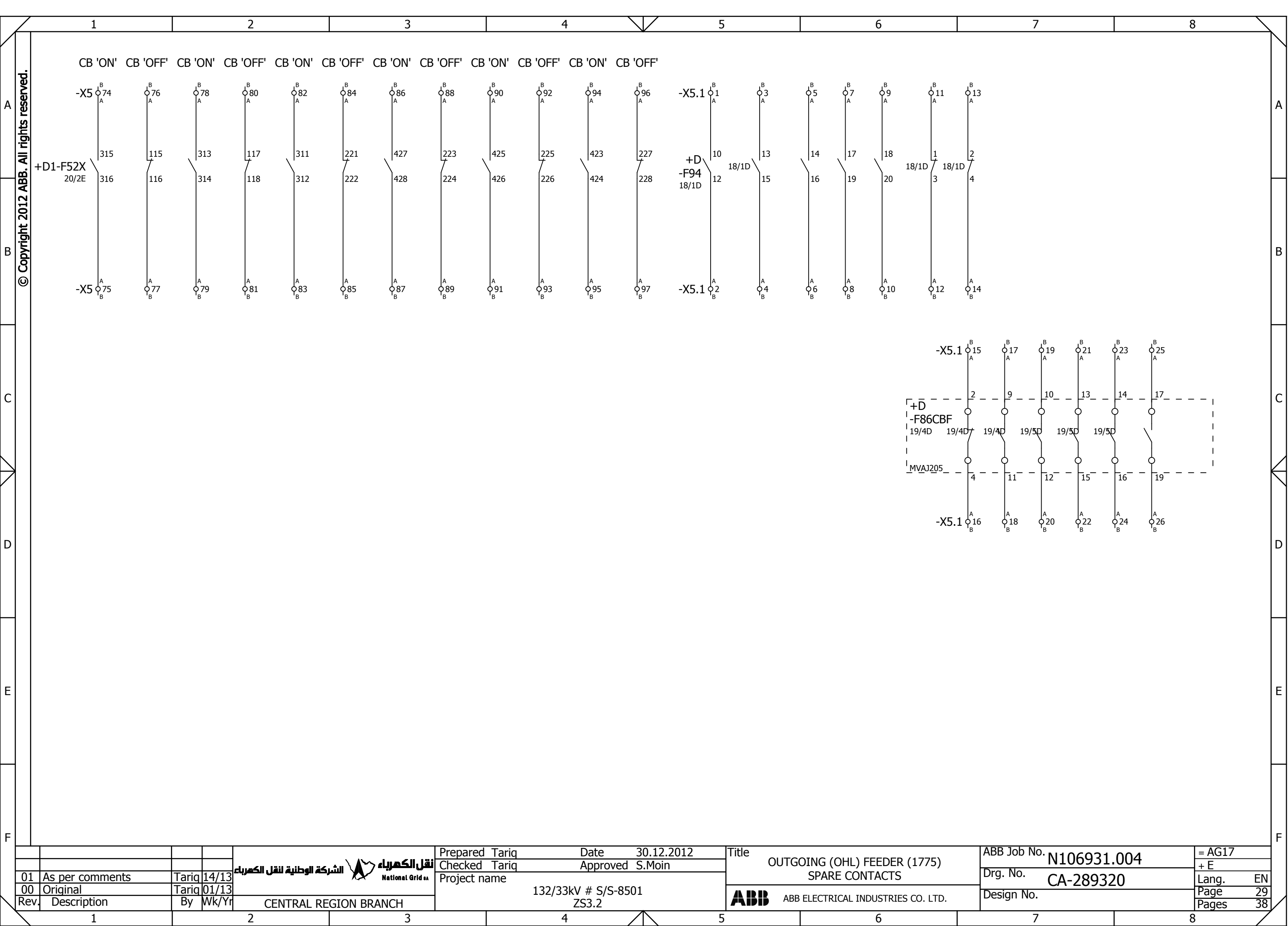


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01 As per comments		Tariq 14/13		Project name		132/33kV # S/S-8501 ZS3.2		Lang. EN		Page 27
00 Original		Tariq 01/13		CENTRAL REGION BRANCH				Design No.		Pages 38
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING (OHL) FEEDER (1775) CONTACTS TO SCADA ALARM	ABB Job No. N106931.004	= AG17
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01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Lang. EN	
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING (OHL) FEEDER (1775) SPARE CONTACTS	ABB Job No. N106931.004	= AG17
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.				Pages 38

A

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A

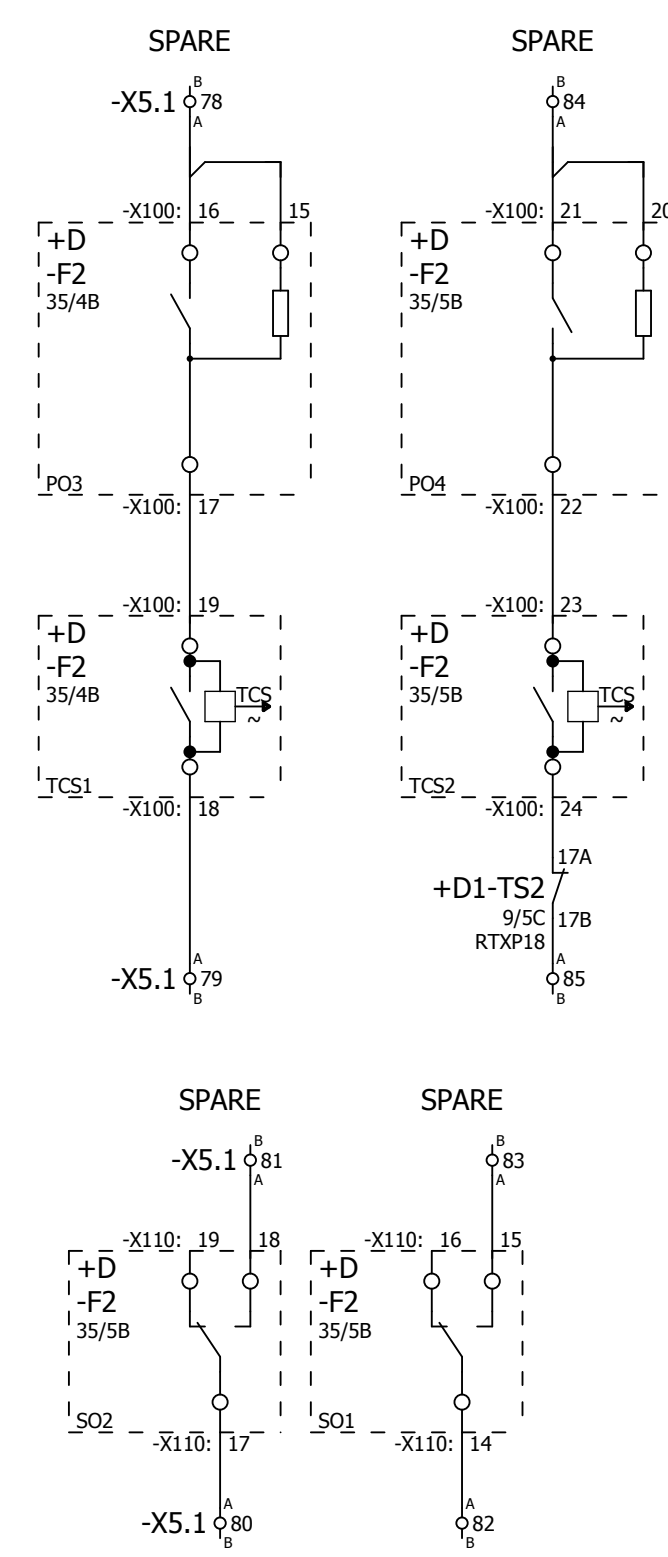
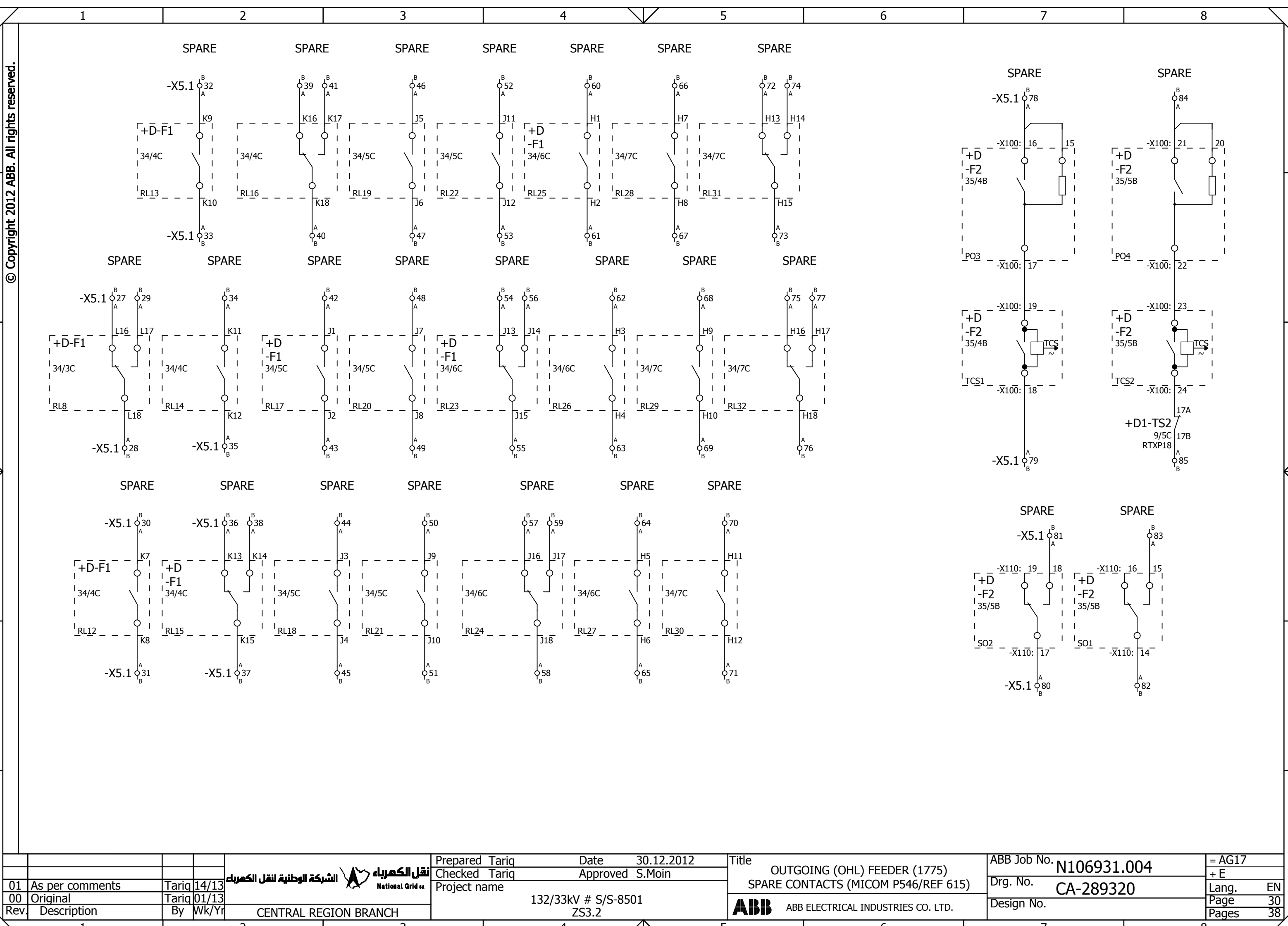
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00	Original	Tariq	01/13										
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH								Page	30
												Pages	38

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MiCOM P546

MiCOM P546

				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING (OHL) FEEDER (1775) MiCOM P546 - DIGITAL INPUTS	ABB Job No.	N106931.004	= AG17
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01	As per comments	Tariq	14/13		Project name						Drg. No.	CA-289320
00	Original	Tariq	01/13		132/33kV # S/S-8501			 ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Page	33
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MiCOM P546

+D-F1 MiCOM P546 : MULTIFUNCTION LINE DIFFERENTIAL RELAY

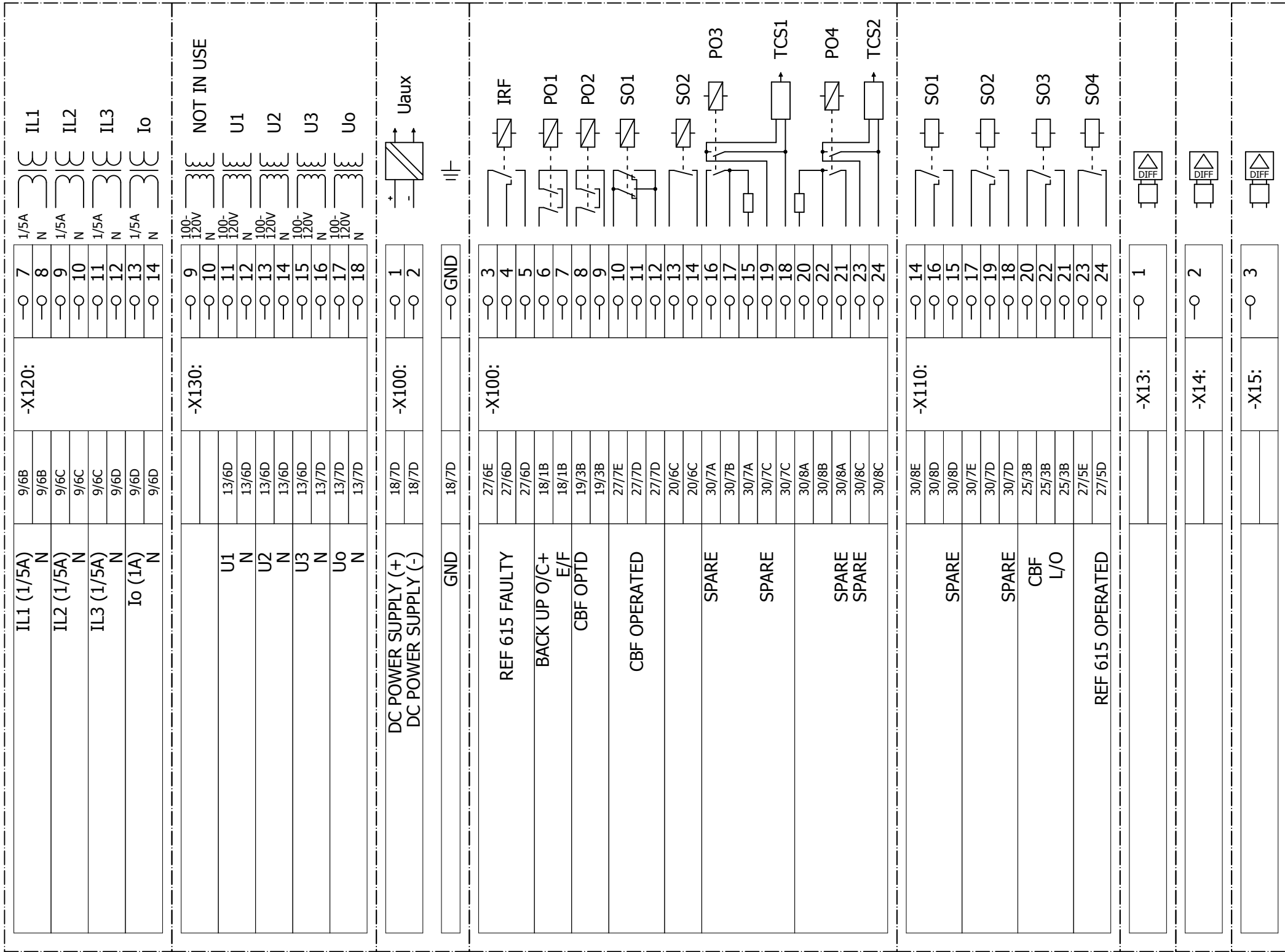
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WATCHDOG CONTACT	27/8B 27/8B		
21, 67N, 50/51,50N/51N	18/2B 18/2B	—○ L1 —○ L2	RL1
TO REF 615	23/2B 23/2B	—○ L3 —○ L4	RL2
AUTORECLOSE	25/6B 25/6B	—○ L5 —○ L6	RL3
21 OPERATED 67N OPERATED	27/5B 27/5B	—○ L7 —○ L8	RL4
A/R OPERATED	27/5B 27/6B	—○ L9 —○ L10 —○ L11 —○ L12	RL5 RL6
A/R LOCKOUT	25/3C 25/4C 25/3C	—○ L13 —○ L14 —○ L15	RL7
SPARE	30/1C 30/1C 30/1C	—○ L16 —○ L17 —○ L18	RL8
A/R IN	27/7B 27/7B	—○ K1 —○ K2	RL9
A/R OUT	27/7B 27/7B	—○ K3 —○ K4	RL10
SPARE	27/8D 27/8E	—○ K5 —○ K6	RL11
SPARE	30/1D 30/1E	—○ K7 —○ K8	RL12
SPARE	30/2A 30/2B	—○ K9 —○ K10	RL13
SPARE	30/2C 30/2C	—○ K11 —○ K12	RL14
SPARE	30/2D 30/2D	—○ K13 —○ K14	RL15
SPARE	30/2E 30/2A 30/3A 30/2B	—○ K15 —○ K16 —○ K17 —○ K18	RL16
SPARE	30/3C 30/3C	—○ J1 —○ J2	RL17
SPARE	30/3D 30/3E	—○ J3 —○ J4	RL18
SPARE	30/3A 30/3B	—○ J5 —○ J6	RL19
SPARE	30/3C 30/3C	—○ J7 —○ J8	RL20
SPARE	30/3D 30/3E	—○ J9 —○ J10	RL21
SPARE	30/4A 30/4B	—○ J11 —○ J12	RL22
SPARE	30/4C 30/4C	—○ J13 —○ J14	RL23
SPARE	30/4D 30/4D	—○ J15 —○ J16	RL24
SPARE	30/4E	—○ J17 —○ J18	
SPARE	30/4A 30/4B	—○ H1 —○ H2	RL25
SPARE	30/4C 30/4C	—○ H3 —○ H4	RL26
SPARE	30/4D 30/4E	—○ H5 —○ H6	RL27
SPARE	30/5A 30/5B	—○ H7 —○ H8	RL28
SPARE	30/5C 30/5C	—○ H9 —○ H10	RL29
SPARE	30/5D 30/5E	—○ H11 —○ H12	RL30
SPARE	30/5A 30/5B	—○ H13 —○ H14	RL31
SPARE	30/5C 30/6C 30/5C	—○ H15 —○ H16 —○ H17 —○ H18	RL32

MiCOM P546

+D-F2

REF 615

REF 615 : BACK UP O/C +E/F RELAY



REF 615

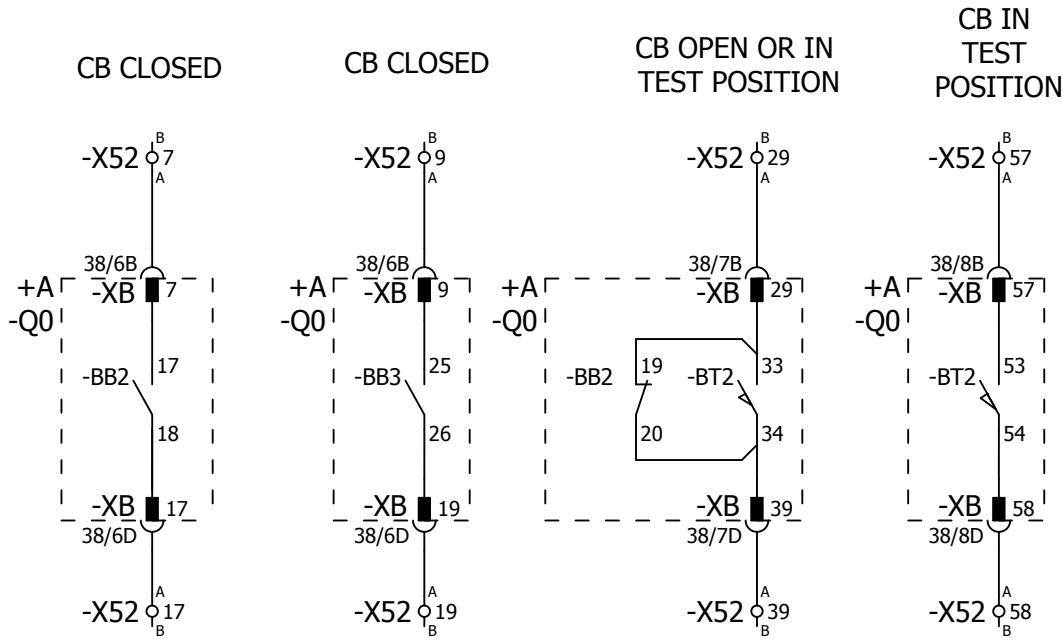
REF 615


REF 615 : FEEDER PROTECTION AND CONTROL



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				<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING (OHL) FEEDER (1775) HD4 SPARE CONTACTS	ABB Job No. N106931.004	= AG17	
					Checked Tariq	Approved S.Moin			+ E	
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2		<div>ABB</div> ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. CA-289320	Lang. EN
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CA-289323

p

C424

11131061/00

JOB ORDER / CONTRACT NO.

INDEX

PLANT NO.

DRAWING NUMBER

REV. NO.

A

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C

D

E

F

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0404
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 800A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE	DRAWING NO.
XXXXX	XXXXX
XXXXX	XXXXX

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

AS-BUILT	BY	DATE				
01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

نقل الكهرباء

الشركة الوطنية لنقل الكهرباء

ABB

National Grid

CENTRAL REGION BRANCH

DRAWN BY

Tariq

CHECKED BY

Tariq

SCALE

DATE STARTED

30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

THIS DRAWING IS NOT TO BE USED FOR
CONSTRUCTION OR FOR ORDERING
MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED
BY
DATE

COVER SHEET

OUTGOING U/G CABLE FEEDER (1175)

132/33kV # S/S-8501

SAUDI ARABIA

ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289323	1 of 38	00

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

DRAWING NUMBER	SHEET NO.	REV. NO.
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S:\SWG Projects DRGS\SEC-COA\N106931-04 SS-8170-8178-8833-8501\Detail Design\8501

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SHEET INDEX

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=AG11+E/1	COVER SHEET	00	Original	01	As per comments				
=AG11+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG11+E/3	Apparatus List	00	Original	01	As per comments				
=AG11+E/4	Terminal Block Schedule	00	Original	01	As per comments				
=AG11+E/5	Single Line Diagram	00	Original	01	As per comments				
=AG11+E/6	Cubicle Assembly	00	Original	01	As per comments				
=AG11+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG11+E/8	CT CORE1-LINE DIFFERENTIAL PROTECTION	00	Original	01	As per comments				
=AG11+E/9	CT CORE2-BACKUP O/C+E/F PROTECTION	00	Original	01	As per comments				
=AG11+E/10	CT CORE3-METERING	00	Original	01	As per comments				
=AG11+E/11	CT CORE4-87B PROTECTION	00	Original	01	As per comments				
=AG11+E/12	ES - INTERNAL WIRING	00	Original	01	As per comments				
=AG11+E/13	BUS VT SUPPLY TO MICOM P546 / REF 615	00	Original	01	As per comments				
=AG11+E/14	AC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG11+E/15	DC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG11+E/16	TRIP CIRCUIT-1 & SUPERVISION	00	Original	01	As per comments				
=AG11+E/17	TRIP CIRCUIT-2 & SUPERVISION	00	Original	01	As per comments				
=AG11+E/18	TRIP RELAY	00	Original	01	As per comments				
=AG11+E/19	CBF STAGE-2 LOCKOUT RELAY	00	Original	01	As per comments				
=AG11+E/20	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG11+E/21	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG11+E/22	BINARY INPUTS-MiCOM P546	00	Original	01	As per comments				
=AG11+E/23	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG11+E/24	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG11+E/25	CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	00	Original	01	As per comments				
=AG11+E/26	INDICATION CIRCUIT	00	Original	01	As per comments				
=AG11+E/27	CONTACTS TO SCADA INDICATION	00	Original	01	As per comments				
=AG11+E/28	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG11+E/29	SPARE CONTACTS	00	Original	01	As per comments				
=AG11+E/30	SPARE CONTACTS (MICOM P546/REF 615)	00	Original	01	As per comments				
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=AG11+E/32	MiCOM P546 - COMMUNICATION PORTS	00	Original	01	As per comments				
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=AG11+E/34	MiCOM P546 - OUTPUTS	00	Original	01	As per comments				
=AG11+E/35	REF615 - A/I + Binary I/O Board	00	Original	01	As per comments				
=AG11+E/36	REF615 BINARY INPUTS	00	Original	01	As per comments				
=AG11+E/37	HD4 SPARE CONTACTS	00	Original	01	As per comments				
=AG11+E/38	HD4 INTERNAL WIRING	00	Original	01	As per comments				

				<div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) SHEET INDEX	ABB Job No. N106931.004 = AG11	
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1	As per comments	Tariq	14/13		Project name				
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ev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					

+D-F86CBF	MV-MVAJ105RA0802	Lockout Relay for CBF stage-2(8 NO + 2 NC)	1
+D-F94	MV-MVAJ101-RA-0802	MVAJ101 , (8 NO + 2 NC)	1
+D-H1	LED-125V-RESDIOD-R	LED48 -125VDC, Resistr+Diode22 DIA, RED	1
+D-H2	LED-125V-RESDIOD-G	LED48 -125VDC, Resistr+Diode22DIA, GREEN	1
+D-H3-4	LED-125V-RESDIOD-W	LED48-125VDC, Resistr+Diode 22 DIA,WHITE	2
+D-H5	LED-125V-RESDIOD-Y	LED48-125VDC, Resistor+Diode,22D,YELLOW	1
+D-P1	MV-V96LI-110-33KV	VOLTMETER, Type: V96LI-VT-A, 33000/110KV	1
+D-P2	MV-A96LI-1A-800-DS	AMMETER, Type : A96LI-CT-A, 800-400/1A	1
+D-P3	MV-M96D-1A-800-DS	MDI(built-in CT)Type: M96D_30,800-400/1A	1
+D-S1	CA10-A216-FUAP530	CB OPEN-NORMAL-CLOSE-Padlock.red handle	1
+D-S2	CA10-A223-FUAP531	BREAKER MODE SW. LOC/REM 20A 4P 2Positn	1
+D-S3	CA10-A260-FUAP534	Space heater SW "Off-Auto-Manual" (K&N)	1
+D-S4	CA10-A204-FUAP535	Lamp Test Switch (K&N)	1
+D-S5	CA10-A007-VMTR	Voltmeter Sel. Switch (K&N)	1
+D-S6	CHR10-A038-AMTR	Ammeter Selector Switch (K&N)	1
+D-S79	CA10-A223-FUAP572	A/R IN-OUT SEL. SWITCH (K&N)	1
+D-S86	MV-1SFA616100R4076	PB Black 1NO+1NC-22 dia-1SFA611100R4076	1
+D-TSM	MV-129A514G01	FT-1 SW-FOR METERING CT/VT ISOL.(6C+4P)	1
+E-E2	DMS 3110	THERMOSTAT 24,48,60,115 & 230V	1
+E-E4	MV 5911 0818-01	FLUORESCENT LAMP WITH DIFFUSER, 120VAC	2
+E-EC	GCE0990162P0101	PANEL HEATER 240V,50W-Boxin-3Met.Cable	1
+E-F11-15	MV-S 282 UC-K6	MCB 6A DC -2P	5
+E-F16-17	MV-S 202-K6	MCB 2 POLE 6A -AC	2
+E-F20-21	MV-S 203-K10	MCB 3 Pole 10 Amp.	2
+E-F22-27	MV-S 203-K4	MCB -3POLE-4A -AC	6
	MV-S 202-K4	MCB -2POLE-4A -AC	1
	VT-GUARD-100-200V	VT OPEN DELTA RESISTOR UNIT >= 13.8KV	1
	MV-S2C-H11L	.Ux contact 1NO+1NC AC -MCB	2
	MV-S2-H11	Aux contact for DC MCB 1No+1NC	5
	MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1
	DMS 924 0004	COMBIFLEX TERMINAL BASE RX 2H (4U 6C)	1
	DMS 924 0002	COMBIFLEX TERMINAL BASE RX4 (4U 12C)	1
		Highlighted components to be supplied as loose items	

				<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>الشركة الوطنية لنقل الكهرباء</div><div>National Grid SA</div></div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (1175) Apparatus List	ABB Job No.	N106931.004	= AG11		
					Checked Tariq	Approved	S.Moin					Drg. No.	CA-289323	+ E
01	As per comments	Tariq	14/13		Project name								Lang.	EN
00	Original	Tariq	01/13		132/33kV # S/S-8501 ZS3.2						Page	3		
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Pages	38	

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TERMINALS

NAME	TYPE	REMARK	QUANTITY	FUNCTION
X3	USST4		13	CONTROL CIRCUIT
X4	USST4		25	CONTROL CIRCUIT
X5	USST4		97	CONTROL CIRCUIT
X5.1	USST4		99	CONTROL CIRCUIT
X7	WTR-4SL		97	SCADA CIRCUIT
X7.1	WTR-4SL		9	SCADA CIRCUIT
X11	OTTA6-T-P/P		16	CT CIRCUIT
X12	OTTA6-T-P/P		16	CT CIRCUIT
X13	OTTA6-T-P/P		22	CT CIRCUIT
X14	OTTA6-T-P/P		13	CT CIRCUIT
X52	USST4		53	CB CIRCUIT
X87	OTTA6-T-P/P		10	CT CIRCUIT
X2	WTL6SL		10	VT CIRCUIT

				Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) Terminal Block Schedule	ABB Job No. N106931.004	= AG11
				Checked Tariq	Approved S.Moin		Drg. No. CA-289323	+ E
01	As per comments	Tariq	14/13	Project name			Design No.	Lang. EN
00	Original	Tariq	01/13	132/33kV # S/S-8501				Page 4
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ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

LEGEND :

50/51 - Line Differential protection relay, Type: MICOM P546
+50N/51N
+87L

51/51N - Over current & Earth fault relay, Type: REF 615

94 - Trip Relay, type: MVAJ101

86CBF - CBF Stage-2 Lockout relay, type: MVAJ105

27C - Trip circuit supervision relay, Type: SPER 1C1
with No-Volt flag indication relay, Type: RXSF1

T.S - Relay test block, type : RTXP24

C.T. - Current Transformer

A - Ammeter, 96X96 Long scale, Class 1.5

MDI - Maximum demand indicator, 96x96
quadrant scale, Class 3, , Time lag= 30min.

ASS - Ammeter selector switch, 4-position

M01,M01 - Tripping coil

MC - Closing coil

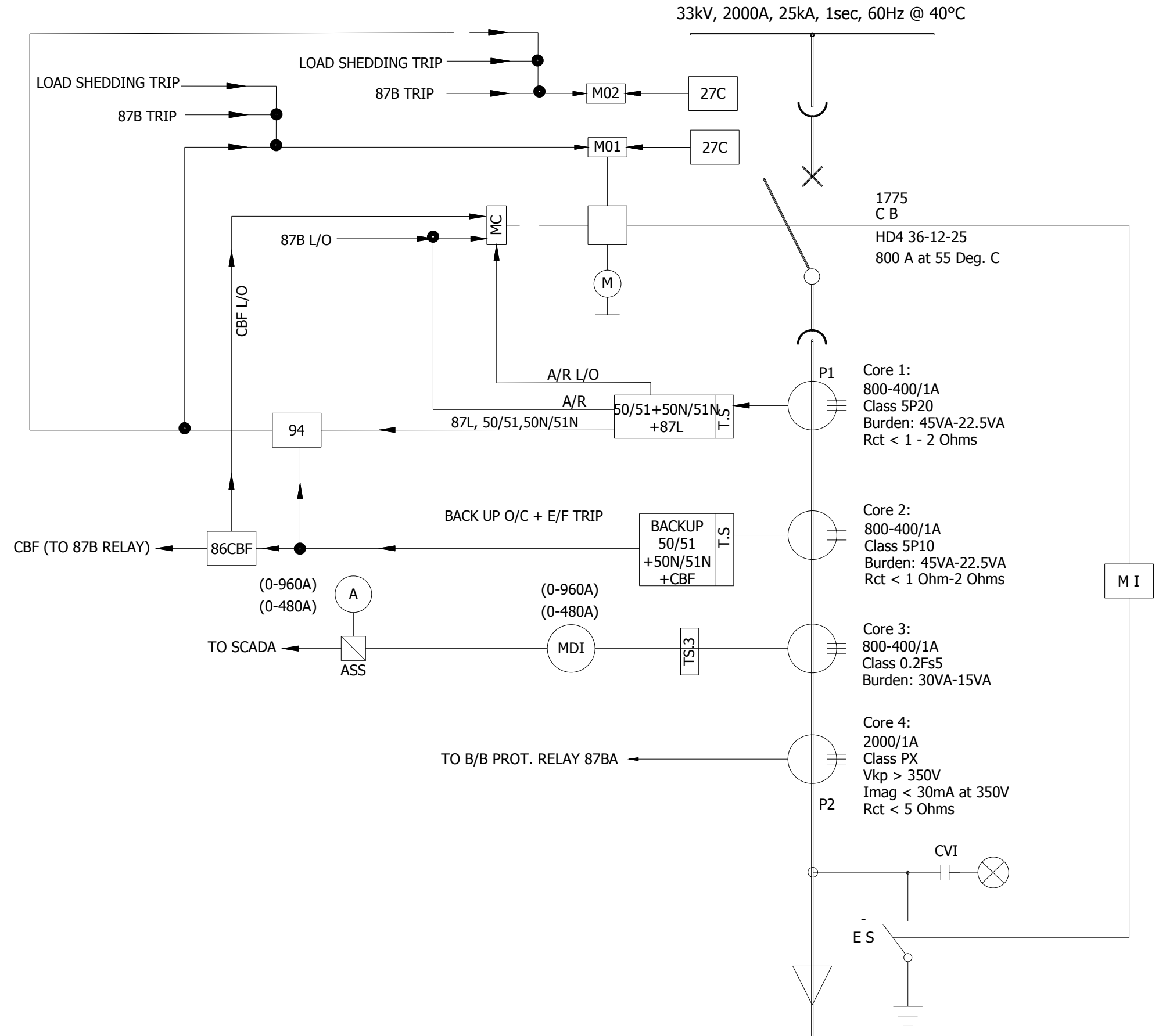
E S - Earthing switch

C B - Circuit Breaker

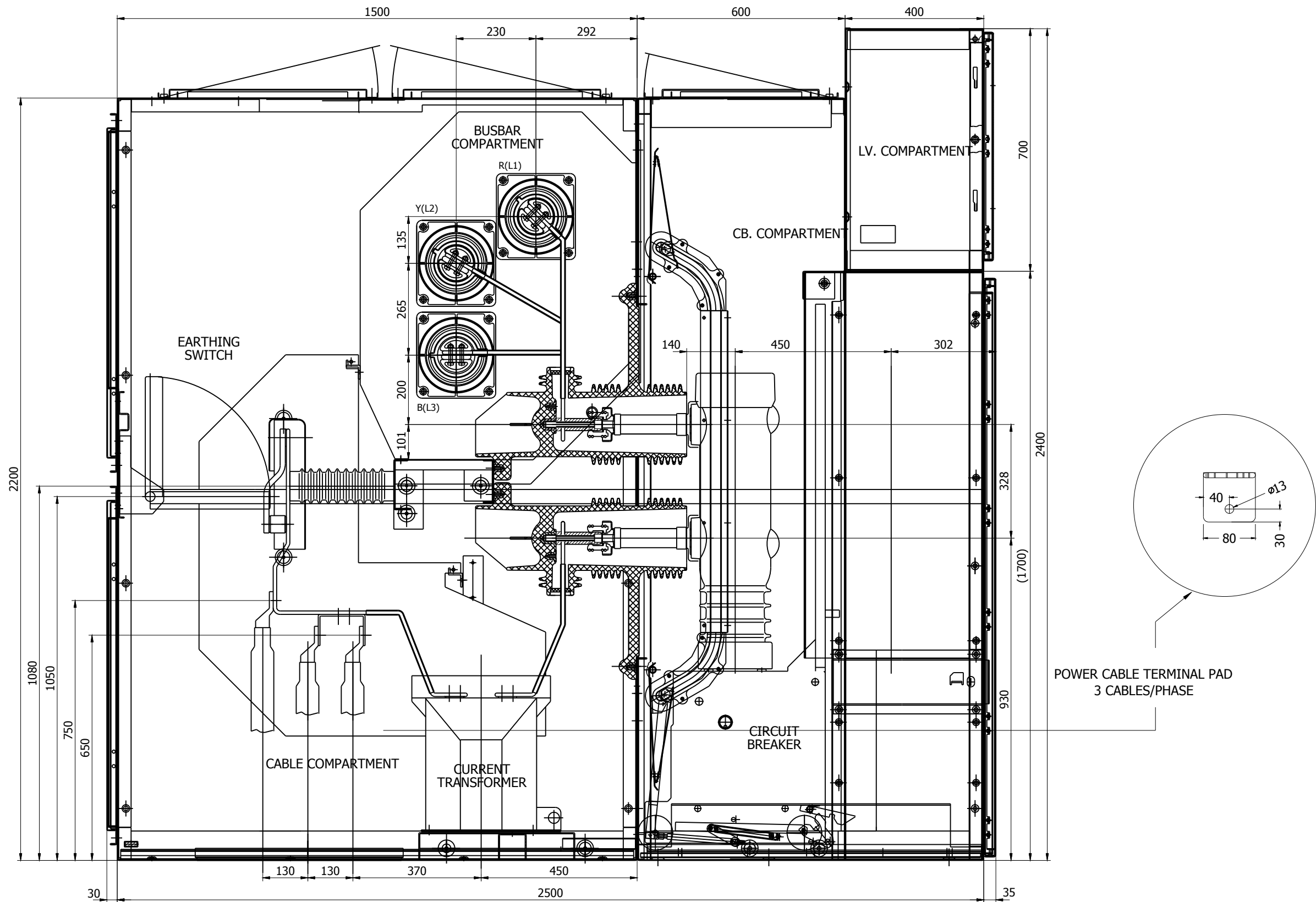
CVI - Capacitive Voltage Indicator


M I - Mechanical interlock

M - CB charging motor



Prepared Tariq		Date 30.12.2012		Title		ABB Job No. N106931.004		= AG11	
Checked Tariq		Approved S.Moin		OUTGOING U/G CABLE FEEDER (1175)		Drg. No. CA-289323		+ E	
Project name		132/33kV # S/S-8501		Single Line Diagram		Design No.		Lang. EN	
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Description		CENTRAL REGION BRANCH		ZS3.2				Pages 38	



				<div><div>الشركة الوطنية لنقل الكهرباء</div><div>نقل الكهرباء</div><div>National Grid SA</div></div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) Cubicle Assembly	ABB Job No.	N106931.004	= AG11
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00	Original	Tariq	01/13							
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Page 6 Pages 38

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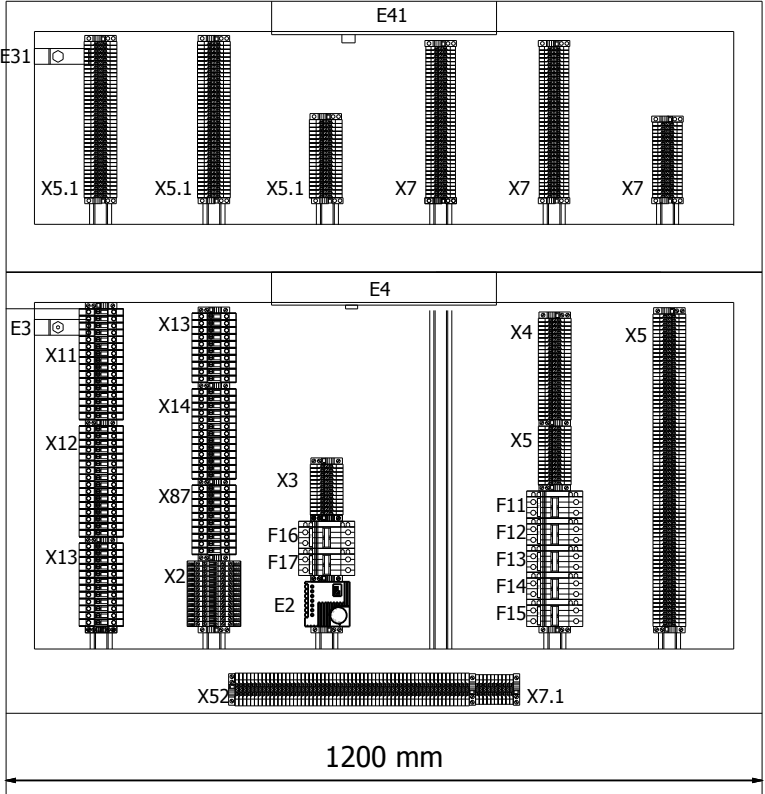
LEGEND : LABEL TEXT

- +D.F1 - 21, 67N, 50/51,50N/51N+79 PROTECTION RELAY
- +D.F2 - BACK UP O/C + E/F & CBF PROTECTION RELAY
- +D.F94 - TRIPPING RELAY
- +D.F86CBF - CBF LOCKOUT RELAY
- +D.H1 - CB "ON"
- +D.H2 - CB "OFF"
- +D.H3 - CB "TEST" POSITION"
- +D.H4 - CB "SERVICE" POSITION"
- +D.H5 - Earth switch "ON"
- +D.P2 - AMMETER
- +D.P3 - MAXIMUM DEMAND METER
- +D.S1 - Breaker control switch, OPEN-NORMAL-CLOSE
- +D.S2 - LOCAL/REMOTE SWITCH
- +D.S3 - SPACE HEATER SELECTOR SWITCH
- +D.S4 - LAMP TEST SWITCH
- +D.S6 - AMMETER SELECTOR SWITCH
- +D.S79 - AUTORECLOSE IN/OUT SWITCH
- +D.S86 - CBF L/O RESET

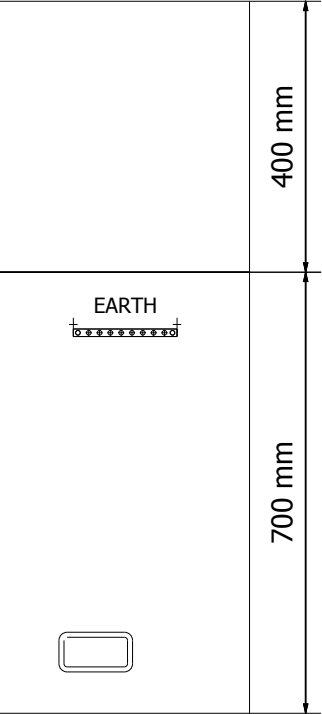
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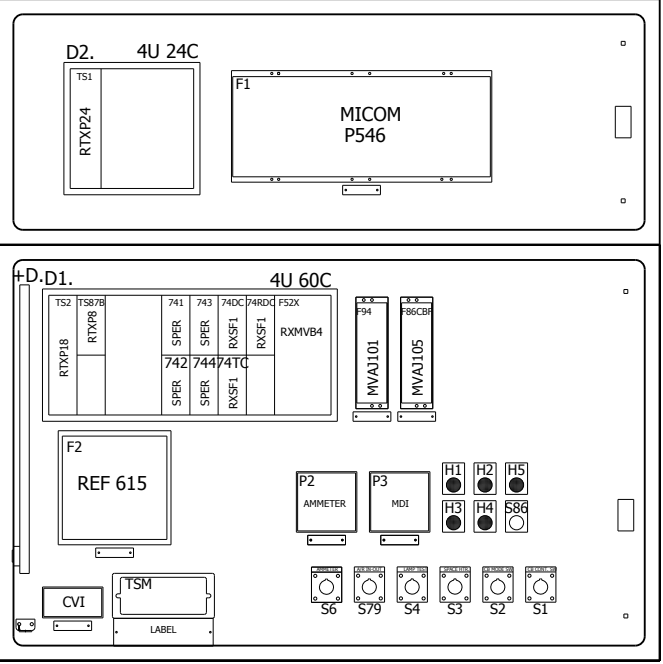
Rear plate +E.



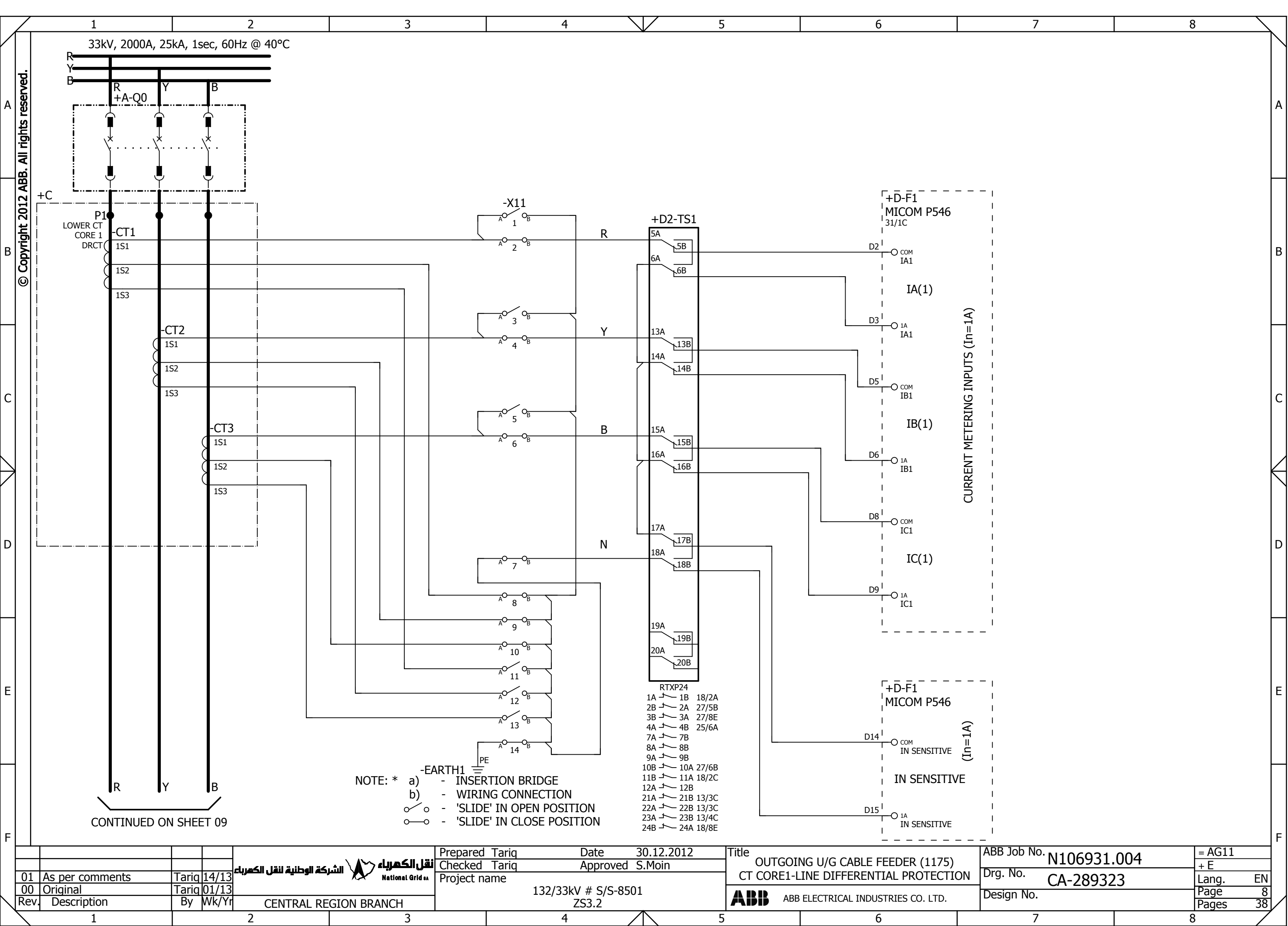
Right side



Apparatus door +D



				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG11
				Checked Tariq	Approved S.Moin	OUTGOING U/G CABLE FEEDER (1175)	N106931.004	+ E
				Project name	132/33kV # S/S-8501	Low Voltage Box Arrangement	Drg. No.	Lang. EN
					ZS3.2	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	CA-289323	Page 7
							Design No.	Pages 38
01	As per comments	Tariq	14/13	الشركة الوطنية لنقل الكهرباء National Grid sa CENTRAL REGION BRANCH				
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Rev.	Description	By	Wk/Yr					



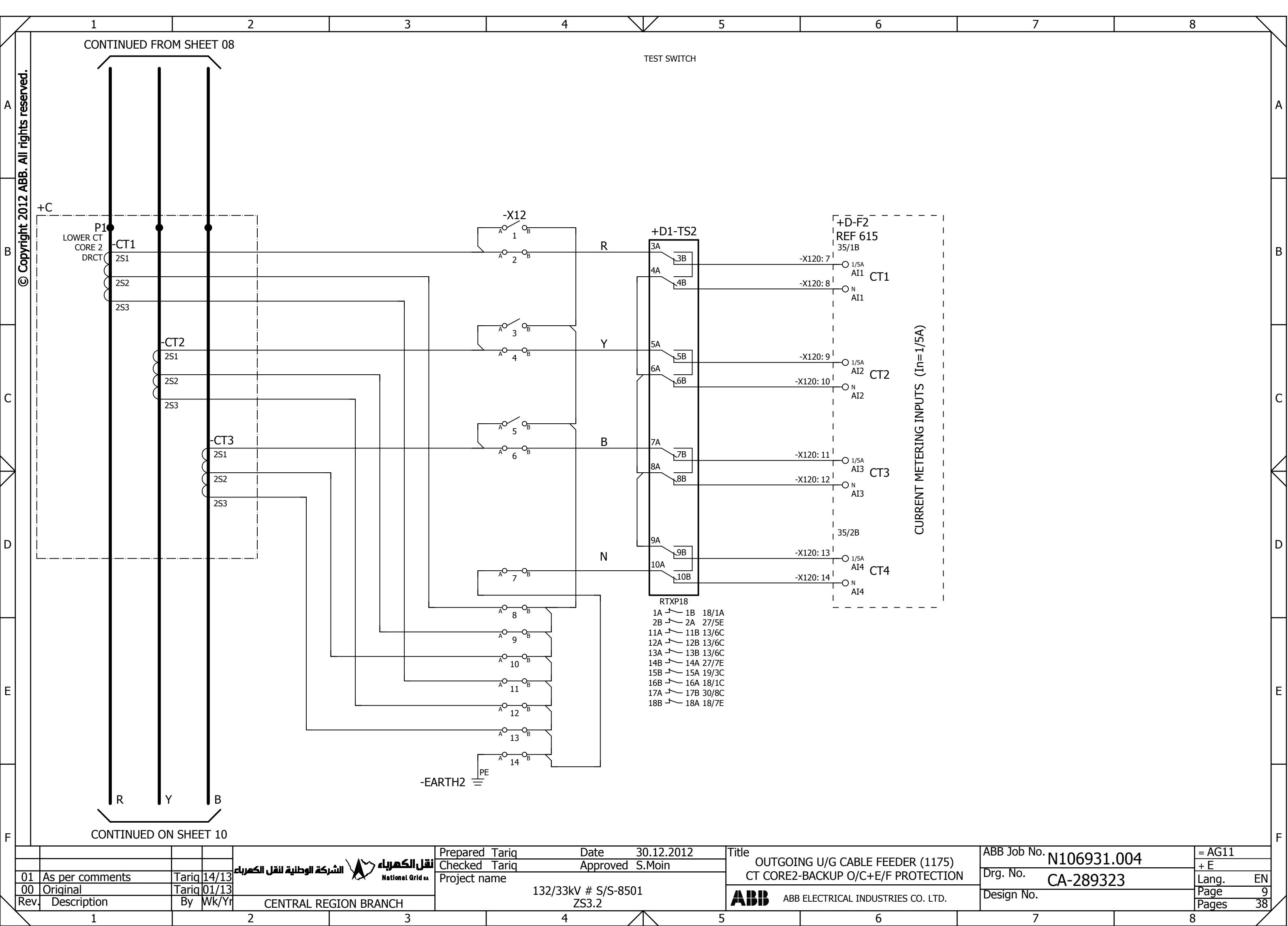
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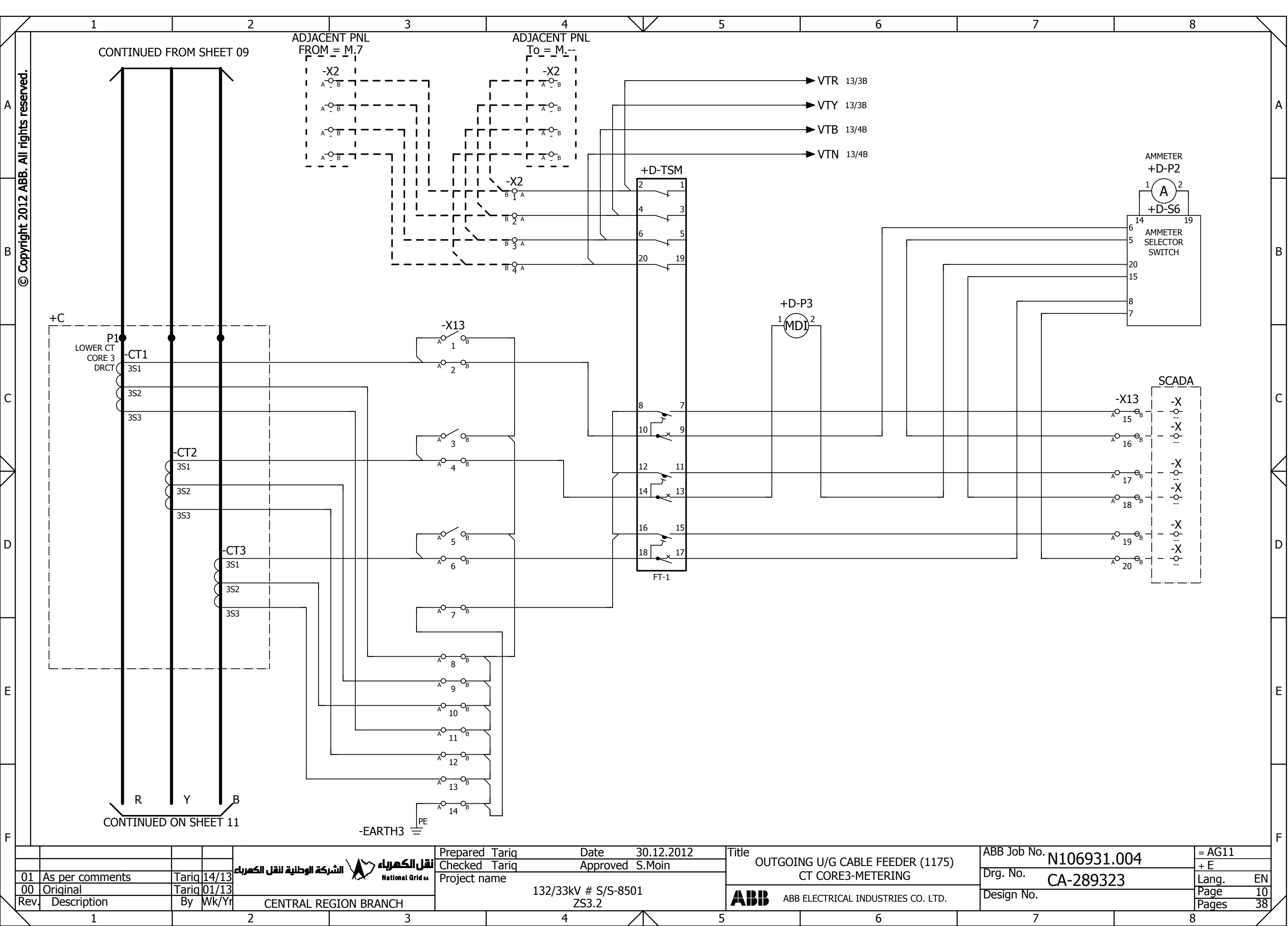
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00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr
			CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	OUTGOING U/G CABLE FEEDER (1175) CT CORE1-LINE DIFFERENTIAL PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG11
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Rev.	Description	By	Wk/Yr

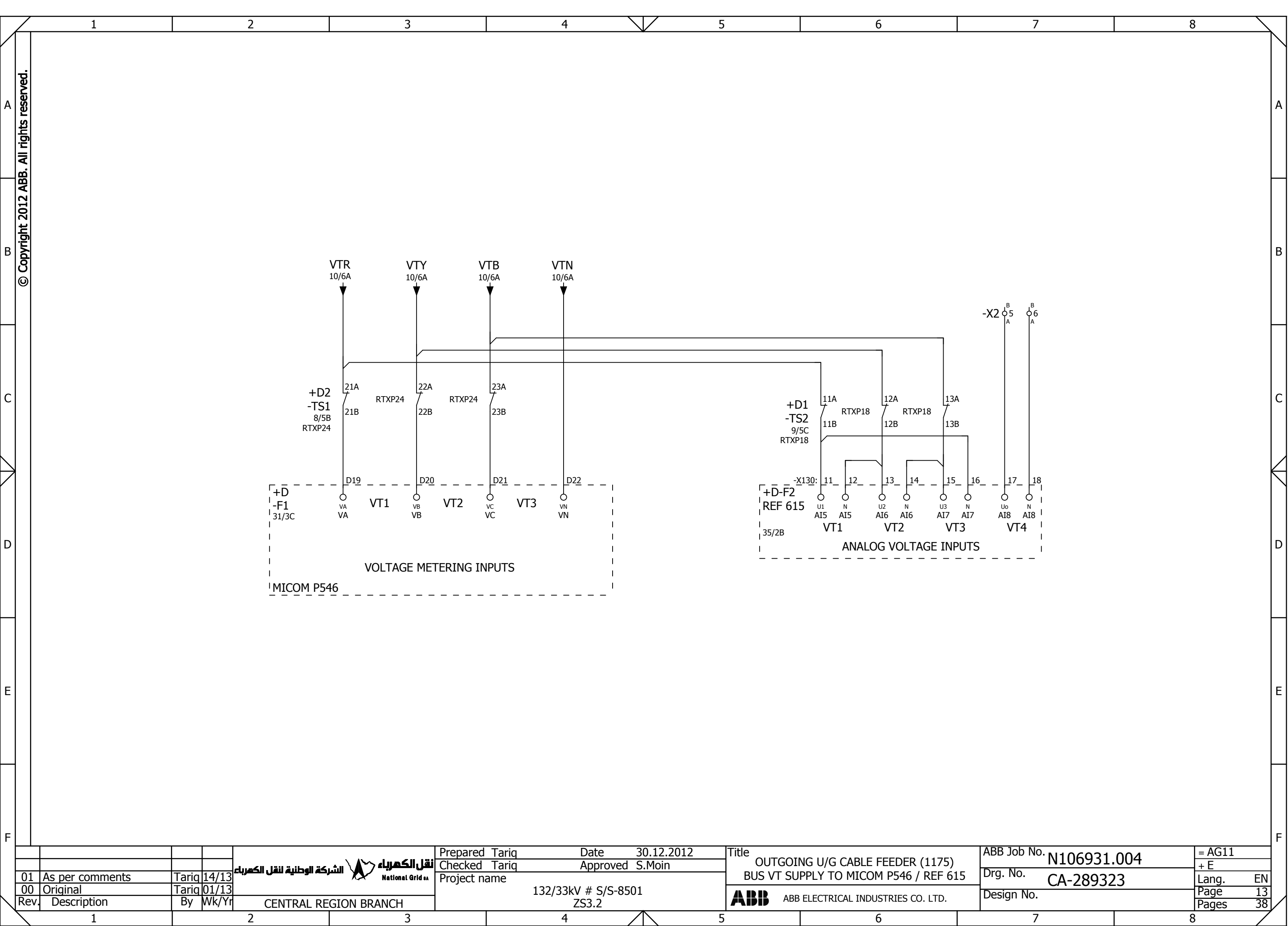
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National Grid sa
CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

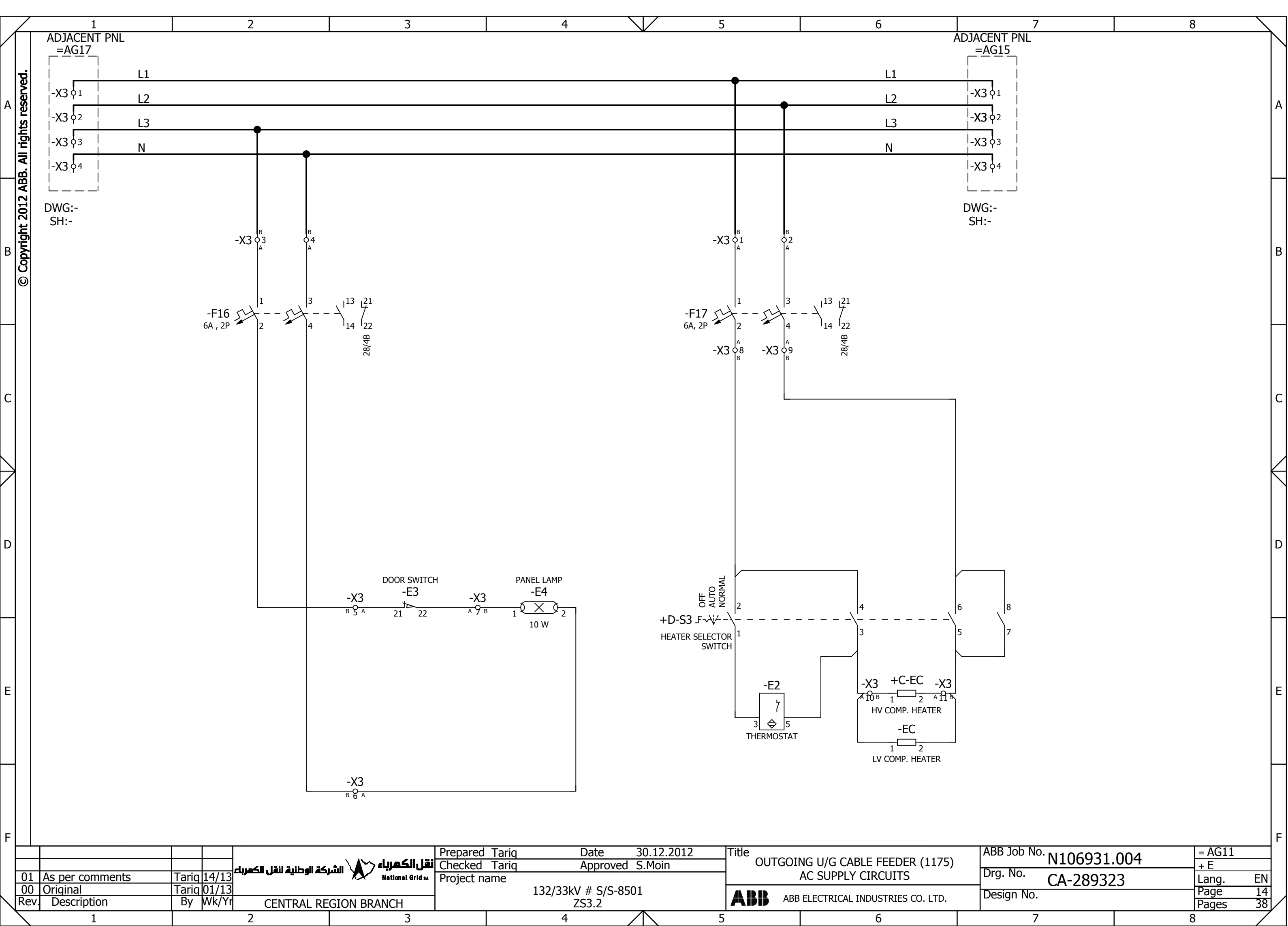
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ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG11
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01	As per comments	Tariq	14/13	Project name		BUS VT SUPPLY TO MICOM P546 / REF 615	Drg. No.	Lang. EN
00	Original	Tariq	01/13				CA-289323	Page 13
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 38



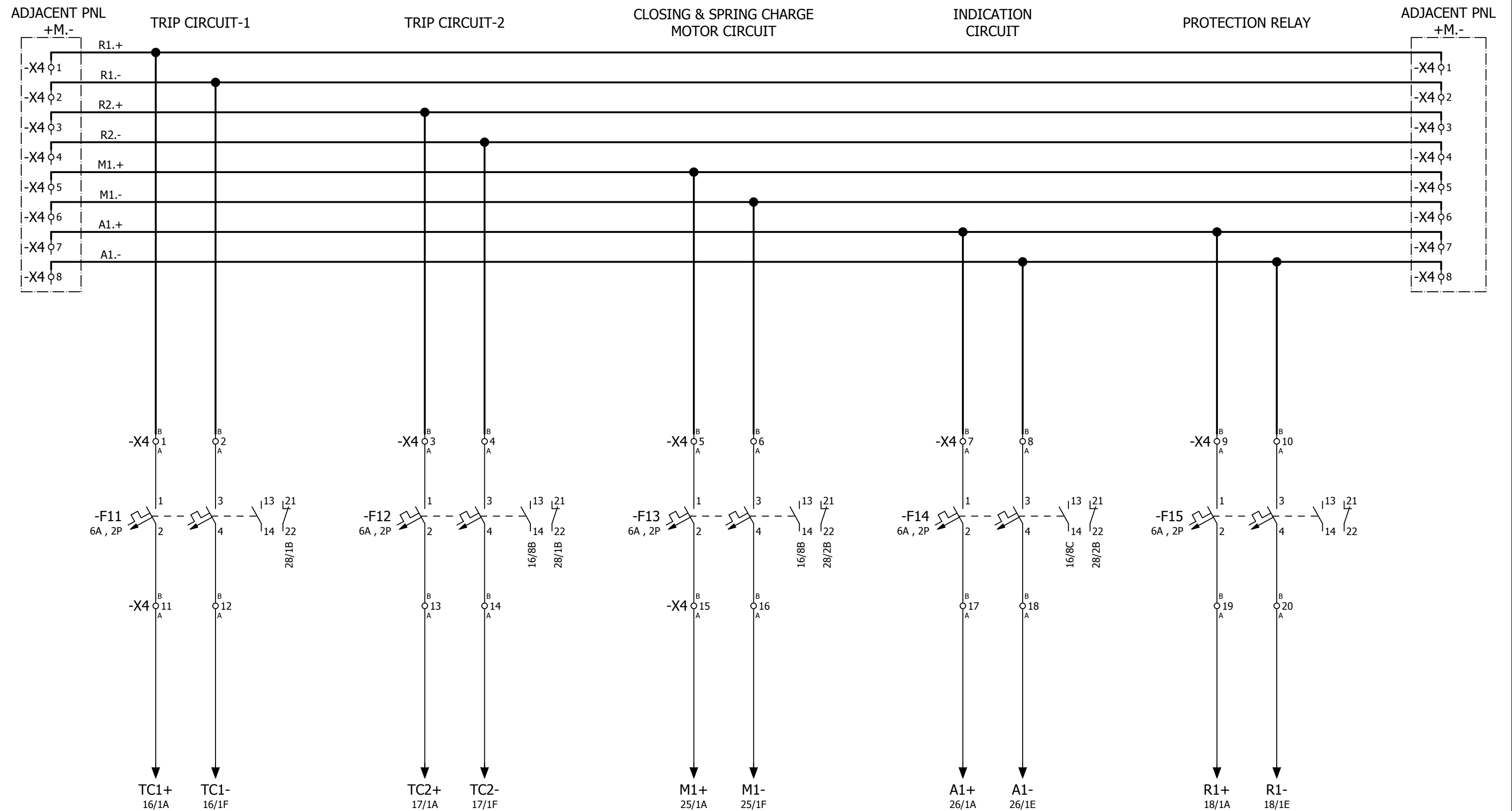
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Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	
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Title	OUTGOING U/G CABLE FEEDER (1175)
	AC SUPPLY CIRCUITS
	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG11
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				<div><div><div></div><div>الشركة الوطنية لنقل الكهرباء</div></div><div><div>نقل الكهرباء</div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (1175) DC SUPPLY CIRCUITS	ABB Job No.	N106931.004	= AG11 + E
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01	As per comments	Tariq	14/13		Project name							
00	Original	Tariq	01/13		132/33kV # S/S-8501			<div><div><div></div><div>ABB</div></div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>	Design No.	CA-289323	Lang.	EN
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											Pages	38

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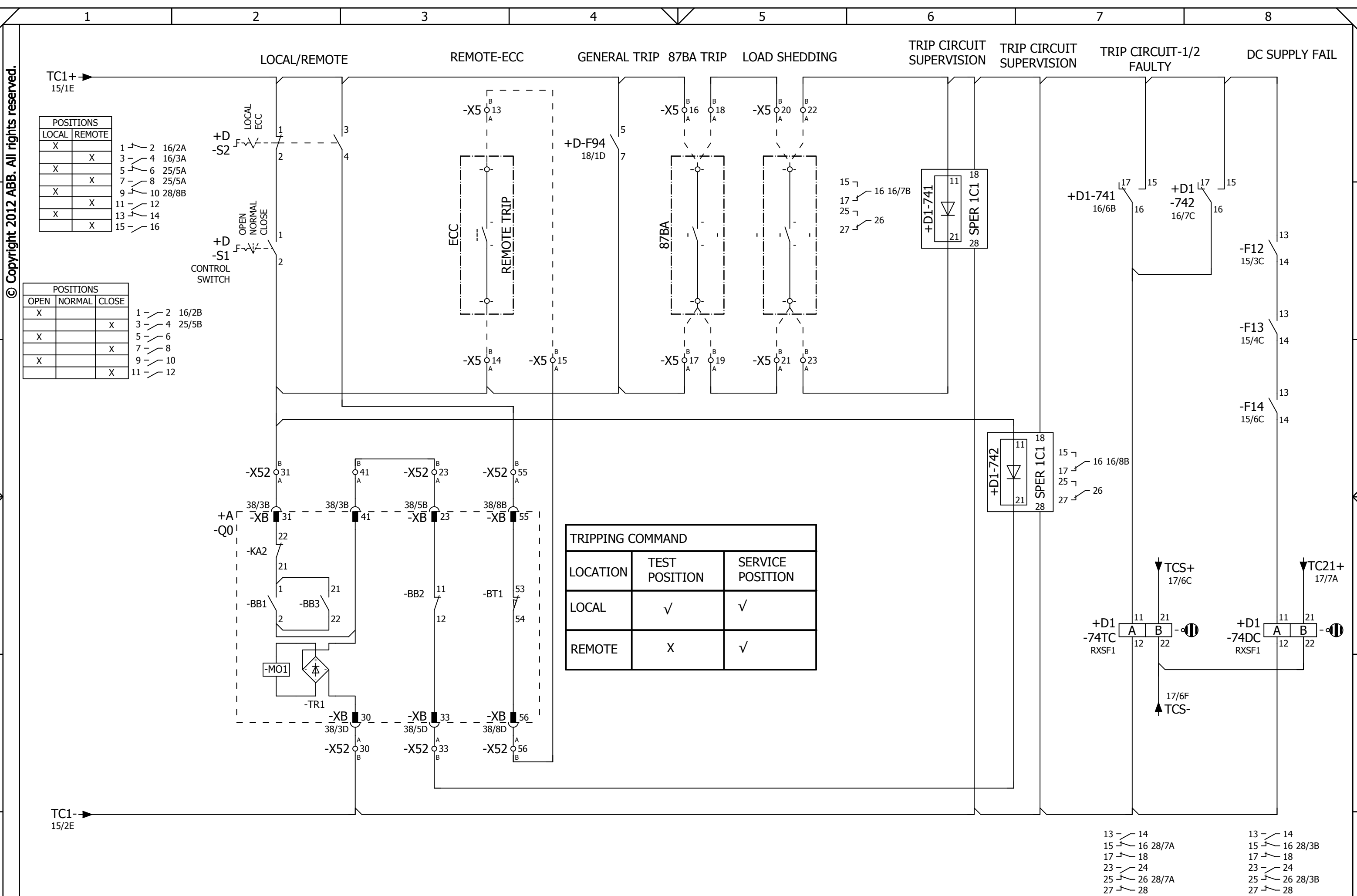
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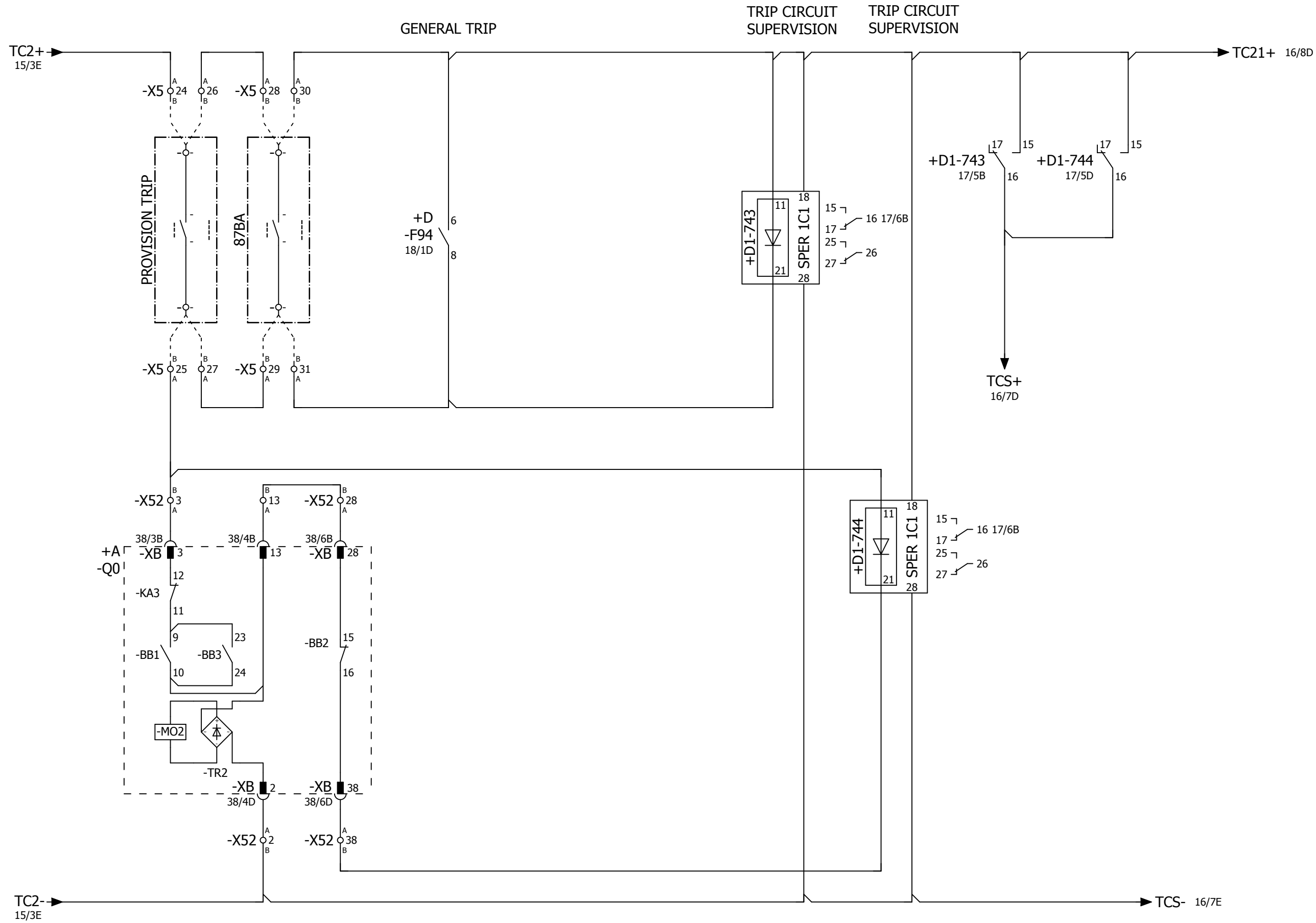
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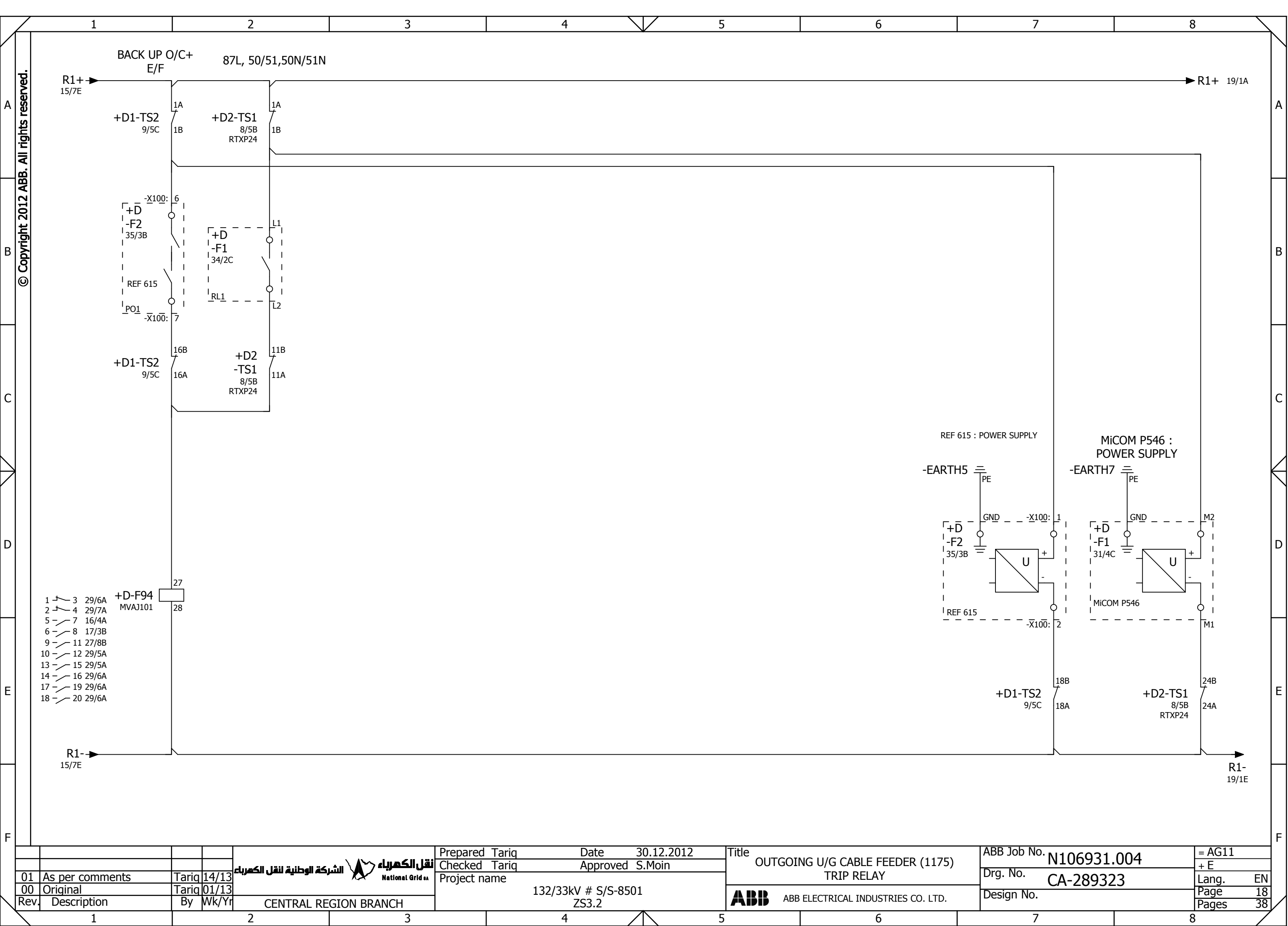
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00	Original	Tariq	01/13							Page 16
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				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (1175) TRIP CIRCUIT-2 & SUPERVISION	ABB Job No.	N106931.004	= AG11 + E
					Checked Tariq	Approved	S.Moin					
					Project name			<div><div><div>ABB</div></div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>	Design No.	CA-289323	Lang. EN Page 17 Pages 38	
					132/33kV # S/S-8501 ZS3.2							
					CENTRAL REGION BRANCH							
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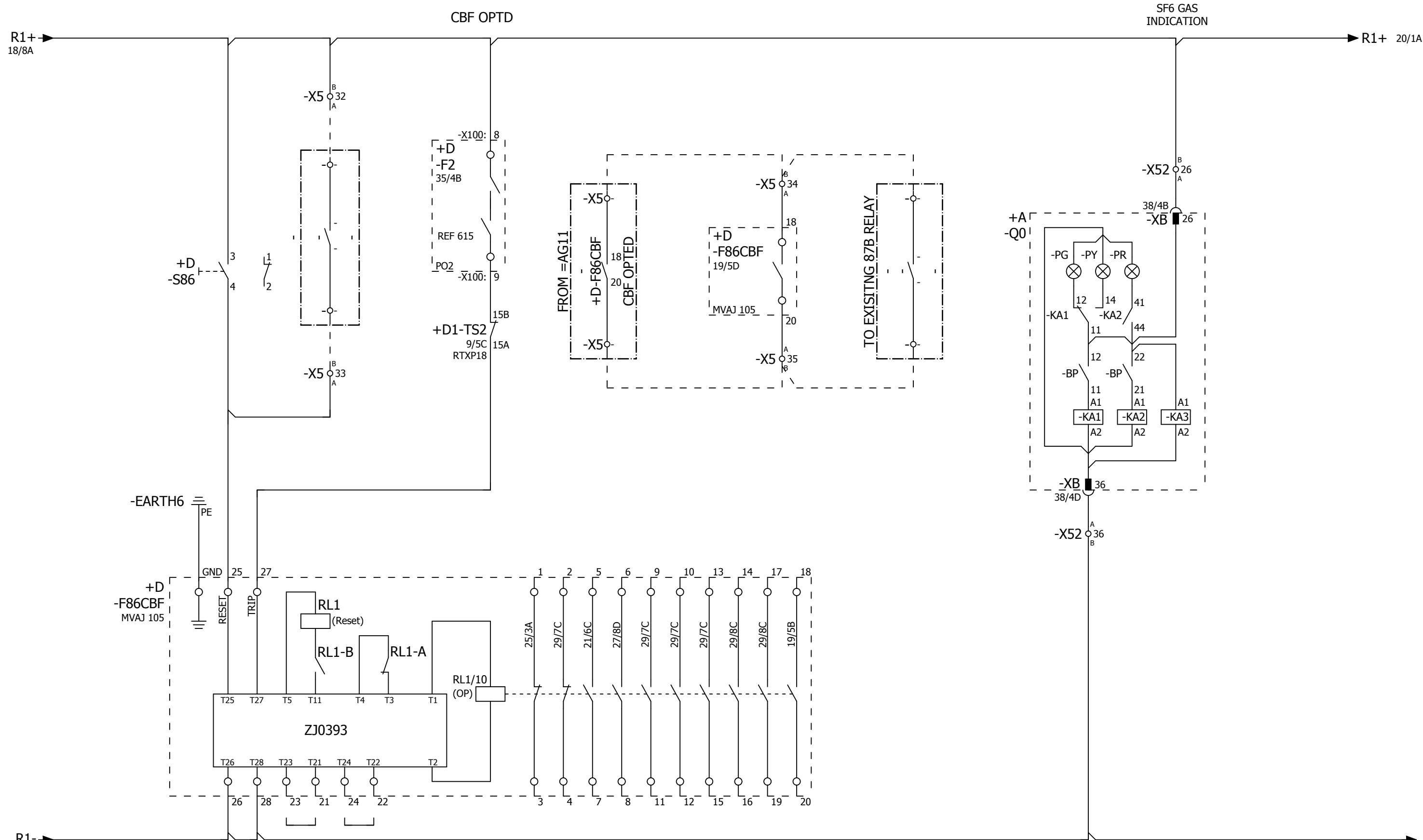


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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	
132/33kV # S/S-8501	
ZS3.2	

ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	Title
		OUTGOING U/G CABLE FEEDER (1175)
		TRIP RELAY

ABB Job No.	N106931.004	= AG11
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(NOTE 2)

(NOTE 1)

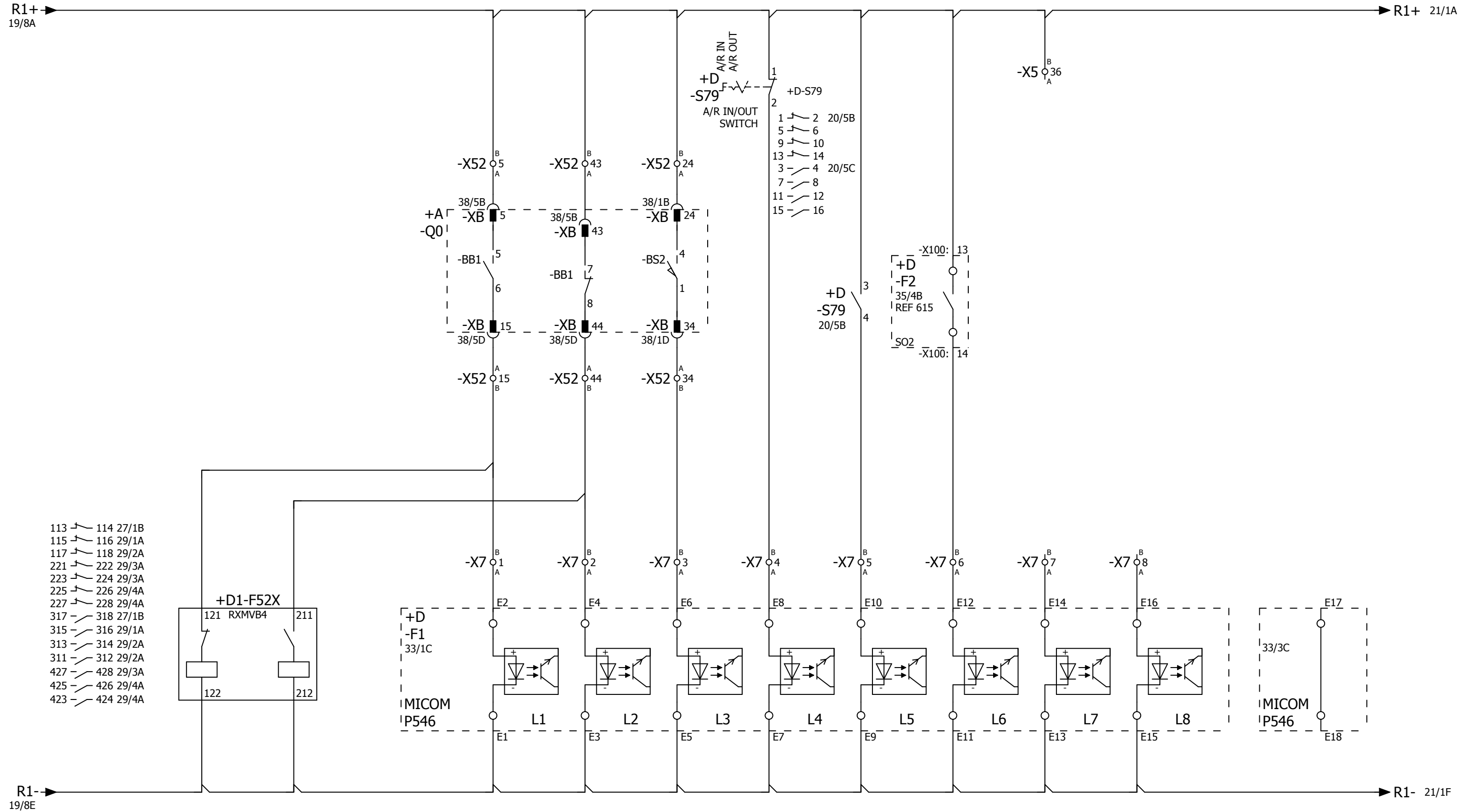
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LINK OUT FOR LOW BURDEN

NOTE 2:
LINK TO ENABLE RESET INHIBITOR/ECONOMISING COIL

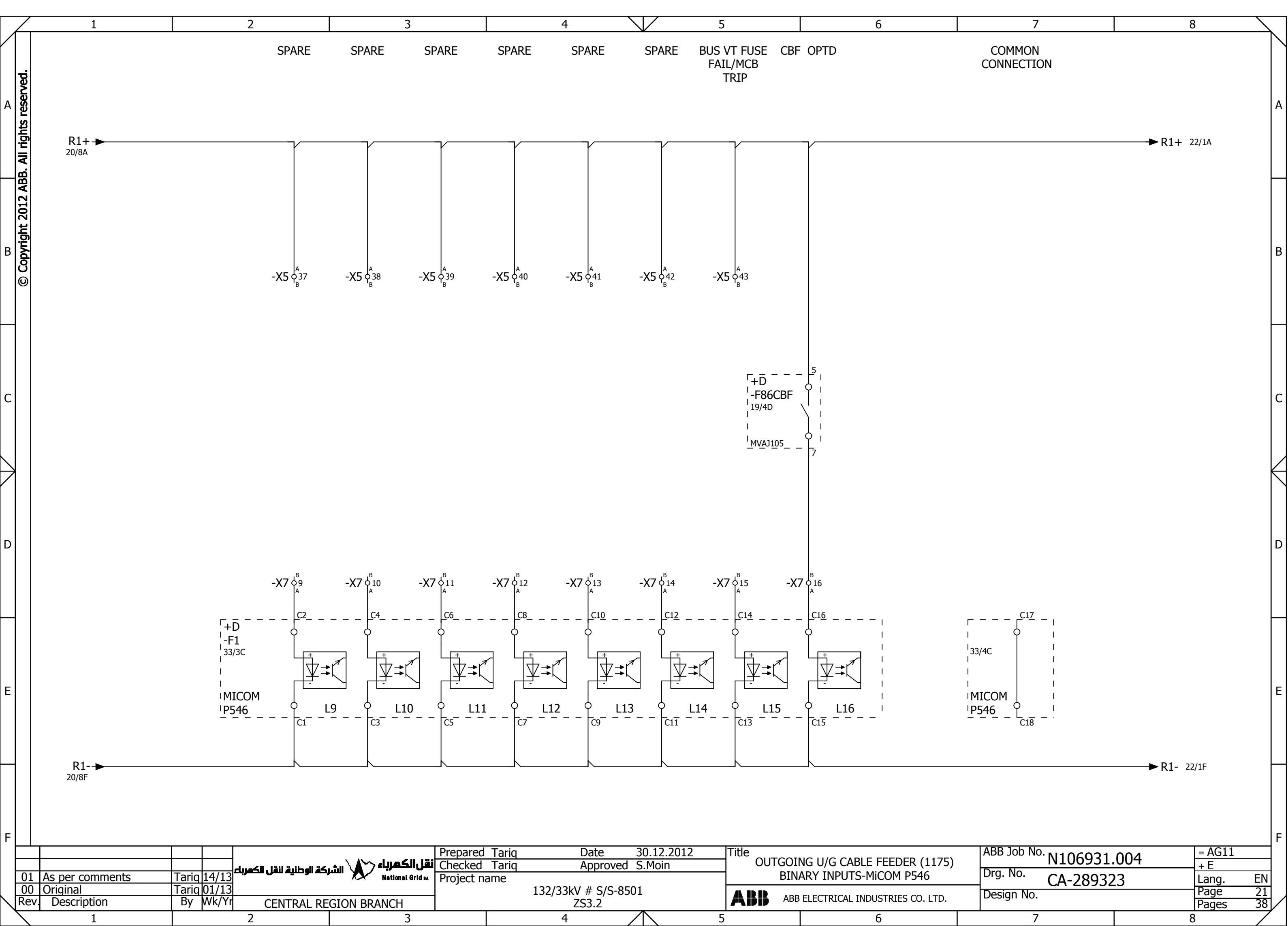
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					Checked Tariq	Approved S.Moin				+ E	
01	As per comments	Tariq	14/13		Project name	132/33kV # S/S-8501 ZS3.2		 ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289323	Lang. EN
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH			Design No.			Page 19	
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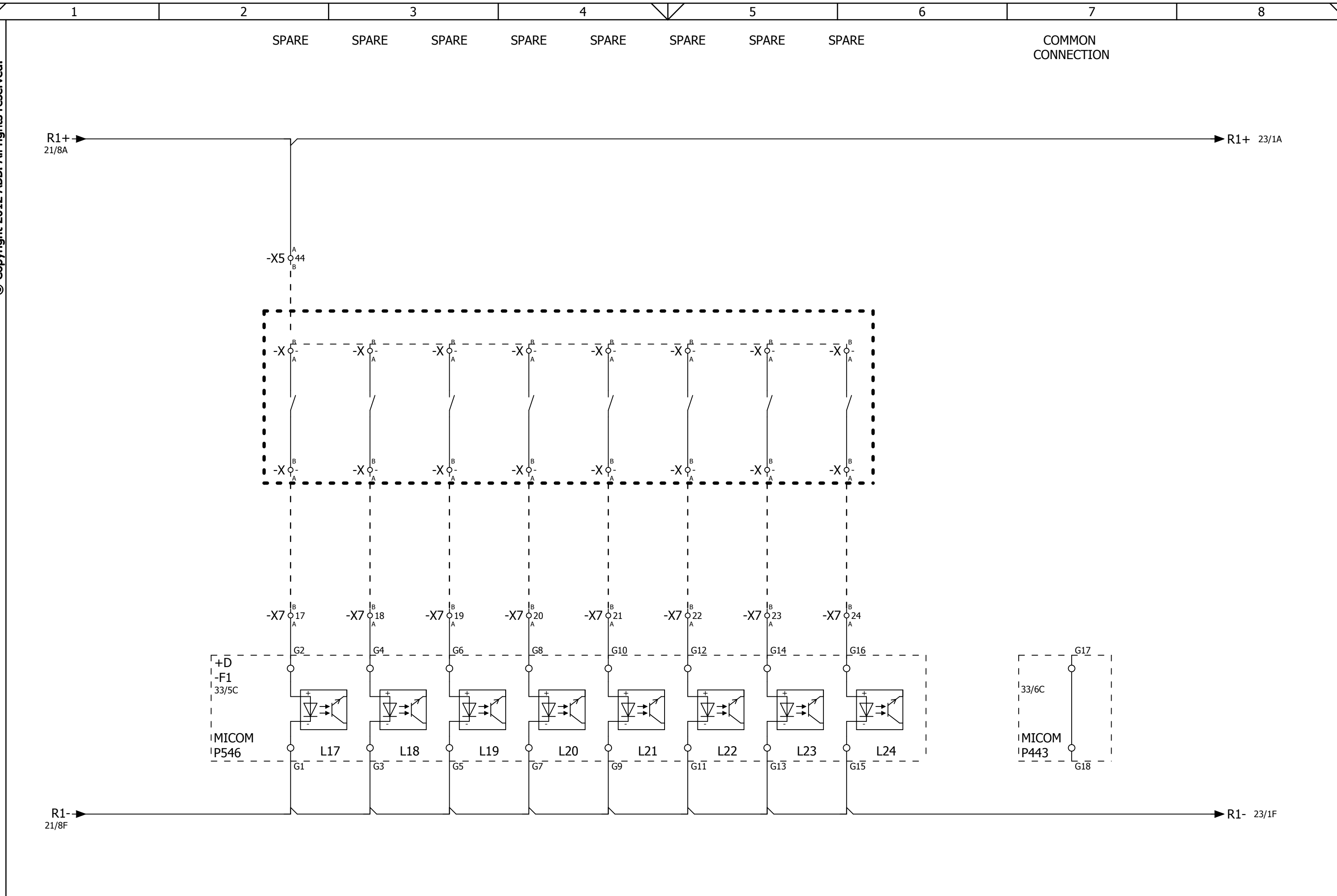
CB 'ON' CB 'OFF' CB SPRING CHARGED A/R IN A/R OUT A/R START 50/51 SPARE SPARE COMMON CONNECTION




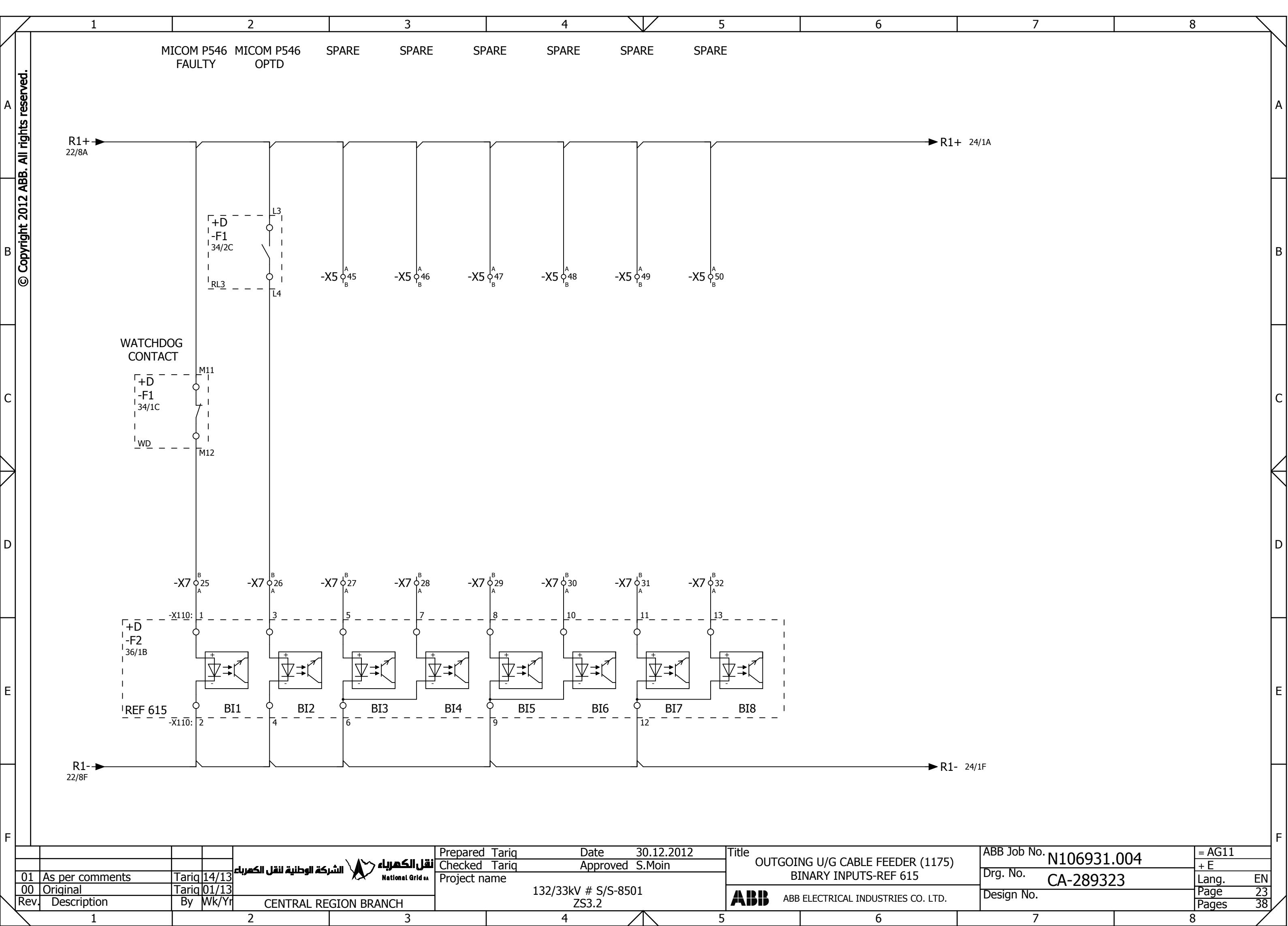
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01	As per comments	Tariq	14/13					
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				<div><div>الشركة الوطنية لنقل الكهرباء</div><div>نقل الكهرباء</div><div>National Grid SA</div></div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) BINARY INPUTS-MICOM P546	ABB Job No.	N106931.004	= AG11
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01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501				Drg. No.	CA-289323
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										Pages 38



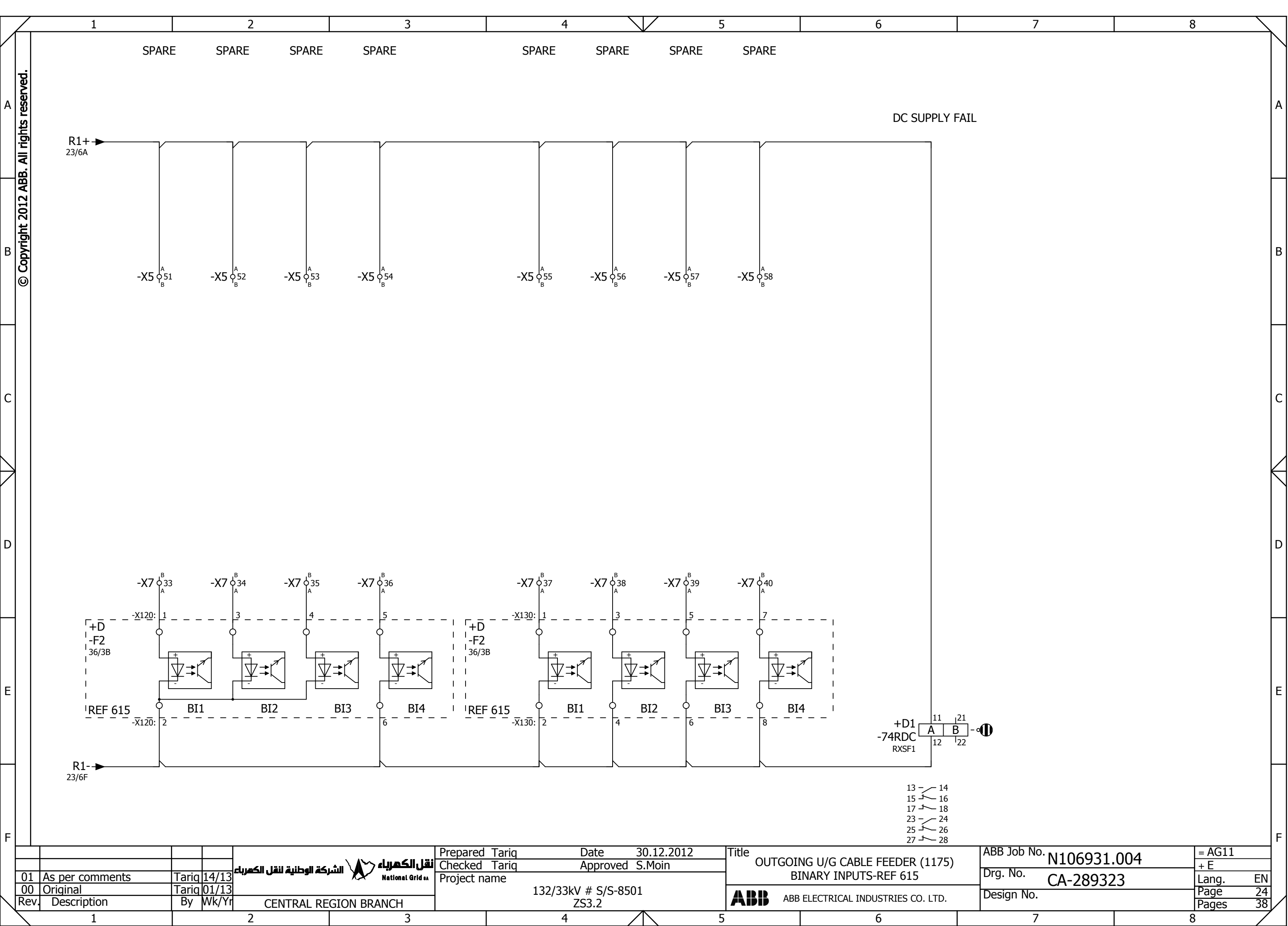
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Rev.	Description	By	Wk/Yr	

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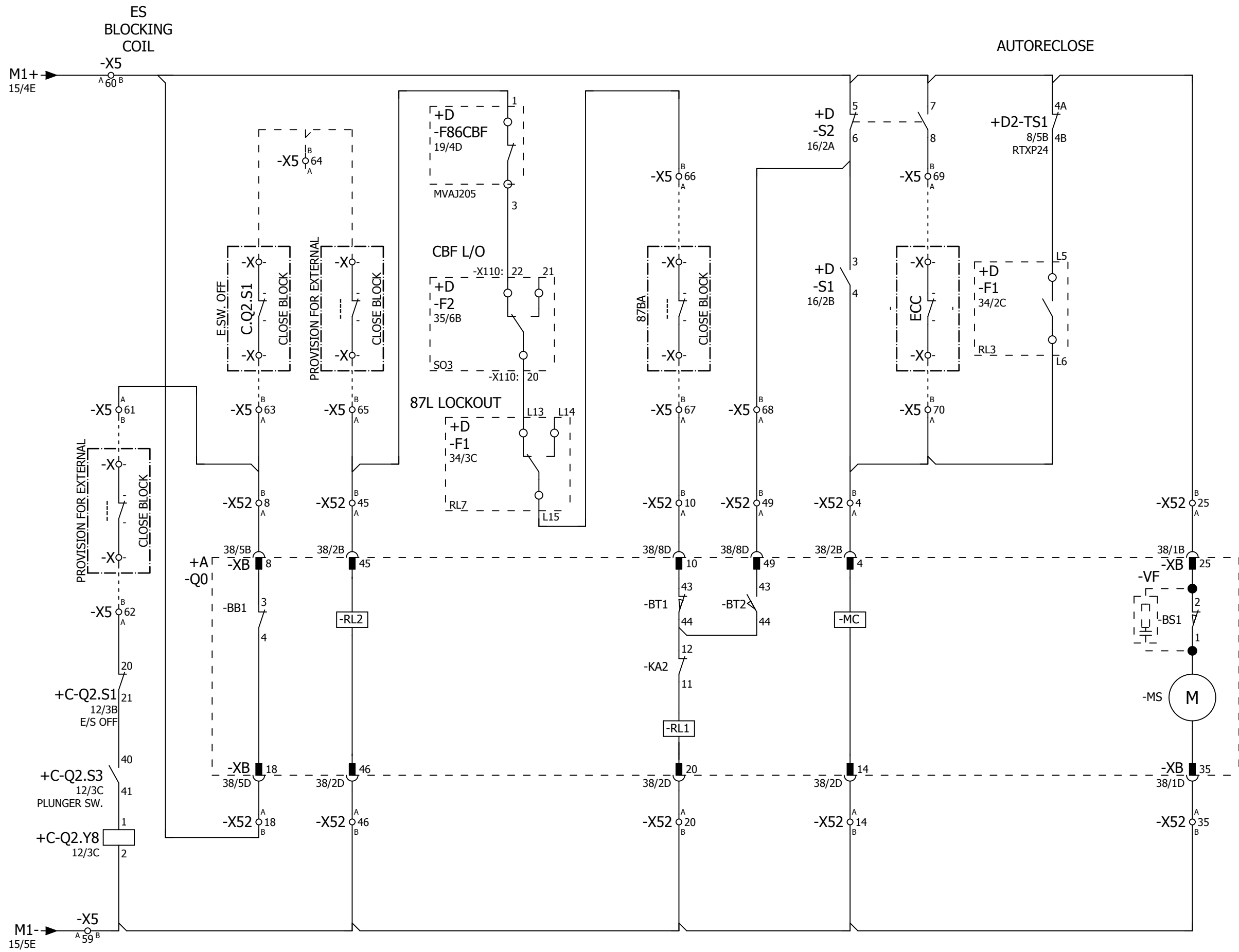
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Project name	
132/33kV # S/S-8501	
ZS3.2	


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		OUTGOING U/G CABLE FEEDER (1175)
		BINARY INPUTS-REF 615

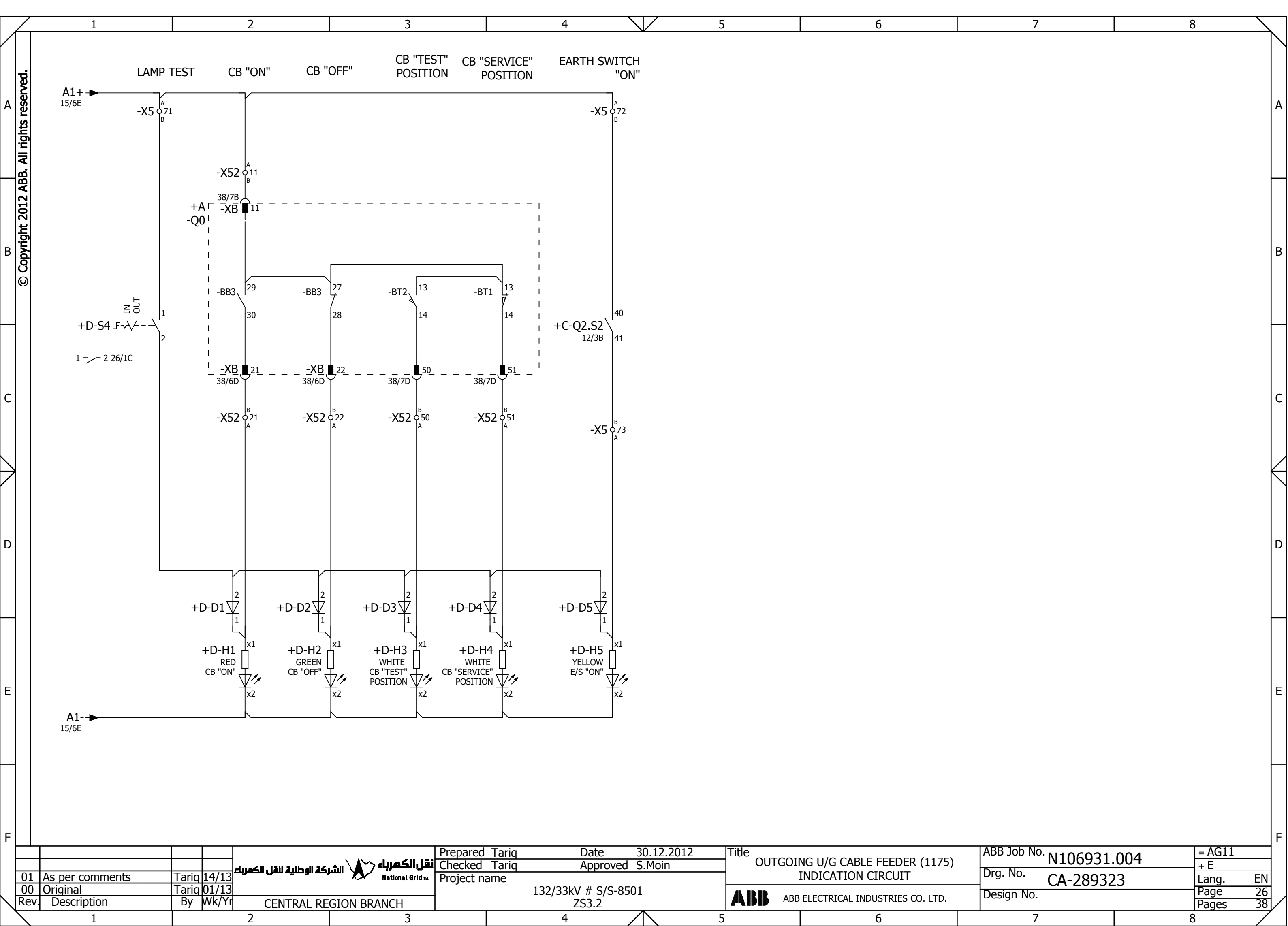
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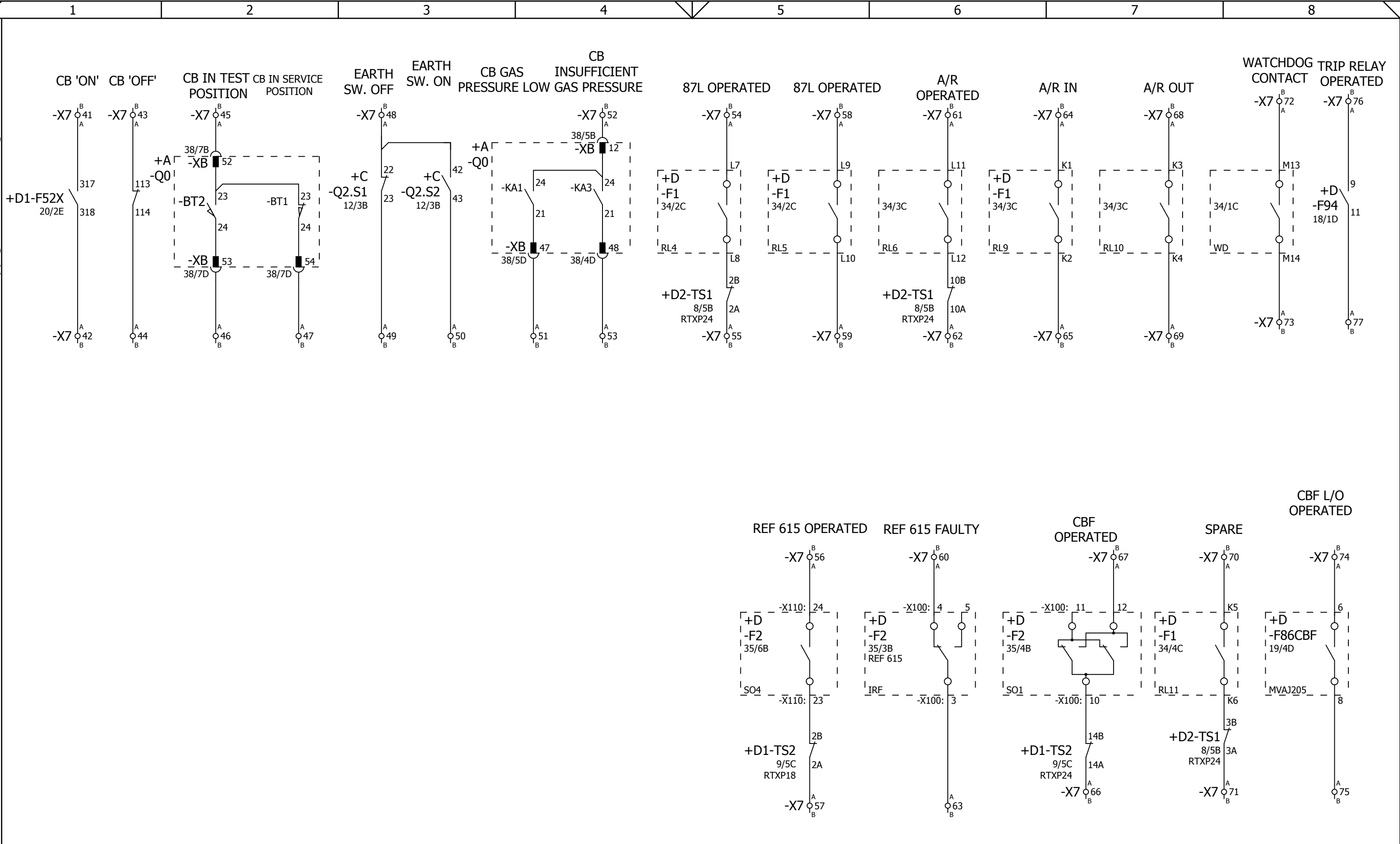
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				<div><div>الشركة الوطنية لنقل الكهرباء</div><div>National Grid SA</div></div>	Prepared Tariq	Date	30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) CLOSING CIRCUIT/CB SPRING CHARGE MOTOR ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No.	N106931.004	= AG11
					Checked Tariq	Approved	S.Moin		Drg. No.	CA-289323	+ E
01 As per comments		Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Design No.	Lang.	EN
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								Pages	38		

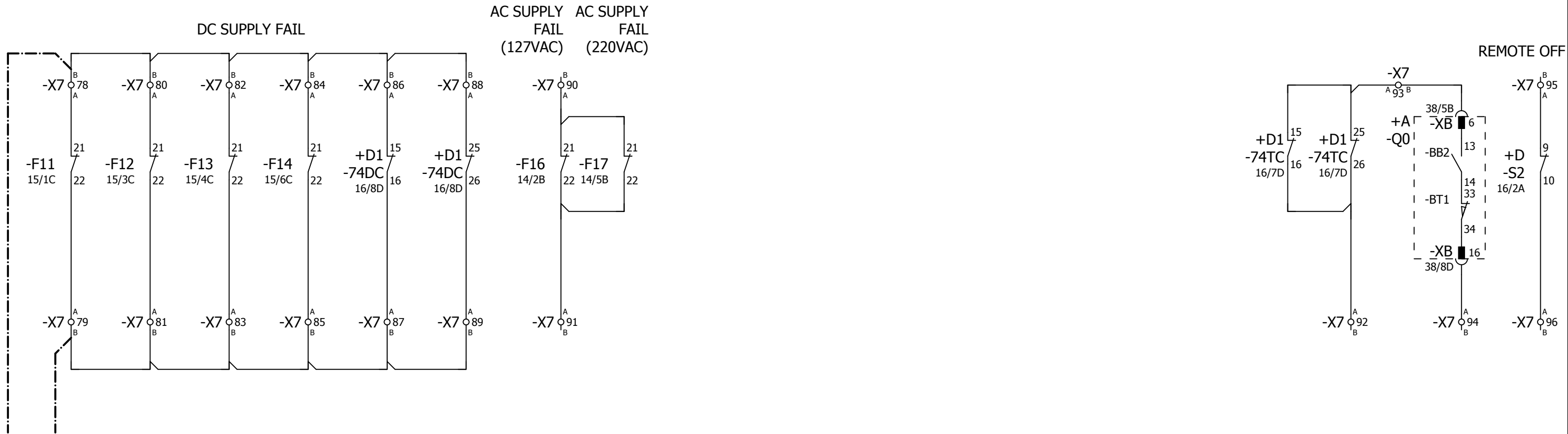



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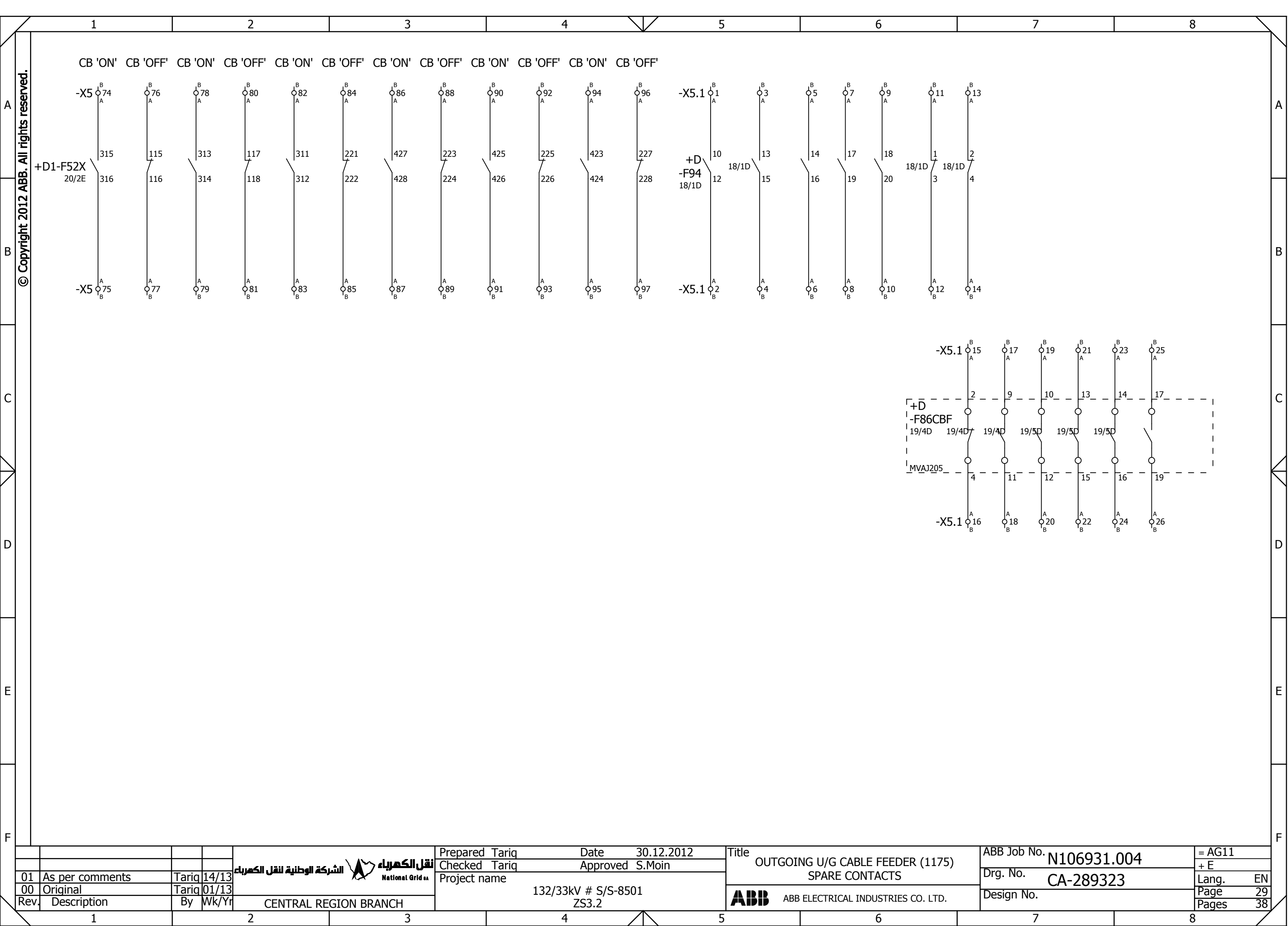


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01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289323	Lang. EN
00	Original	Tariq	01/13					Design No.		Page 27
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) CONTACTS TO SCADA ALARM	ABB Job No. N106931.004	= AG11
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01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Drg. No. CA-289323	Lang. EN
00	Original	Tariq	01/13						
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title OUTGOING U/G CABLE FEEDER (1175) SPARE CONTACTS	ABB Job No.	N106931.004	= AG11	
01	As per comments	Tariq	14/13		Checked Tariq	Approved S.Moin			Drg. No.	CA-289323	+ E
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Rev.	Description	By	Wk/Yr		CENTRAL REGION BRANCH						

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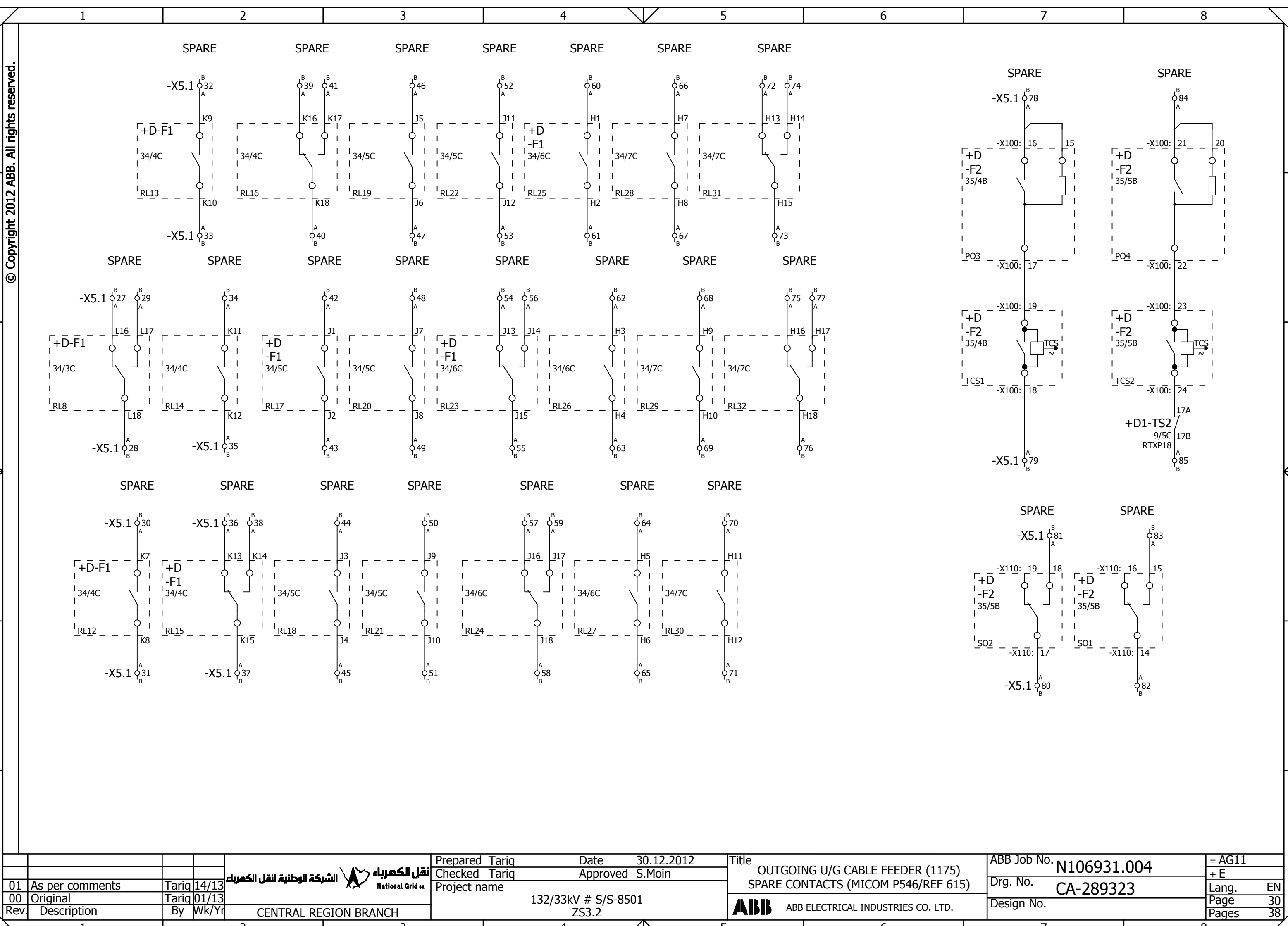
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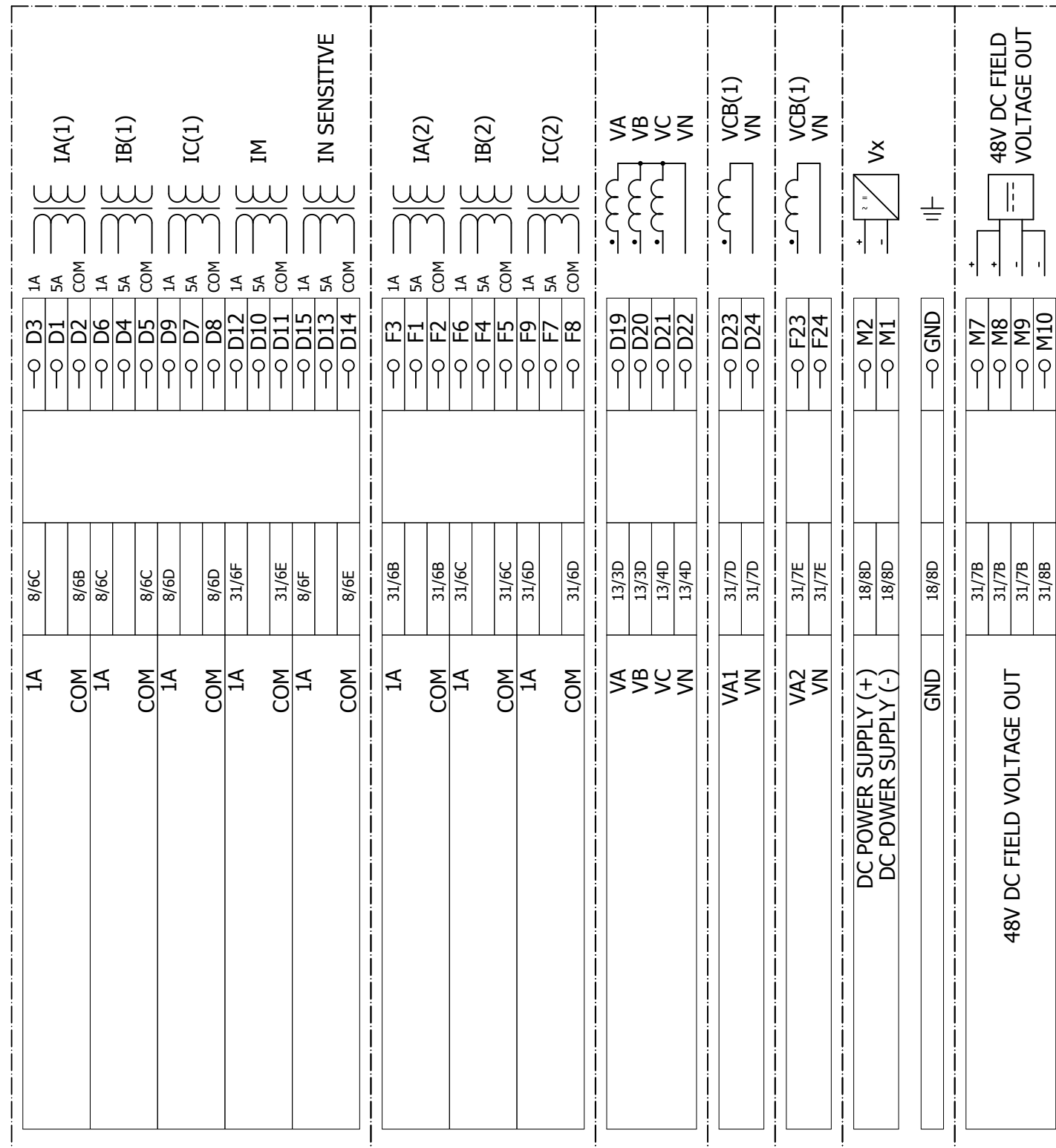


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01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Design No.	Lang.	EN
00	Original	Tariq	01/13								
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										Pages	38

MiCOM P546

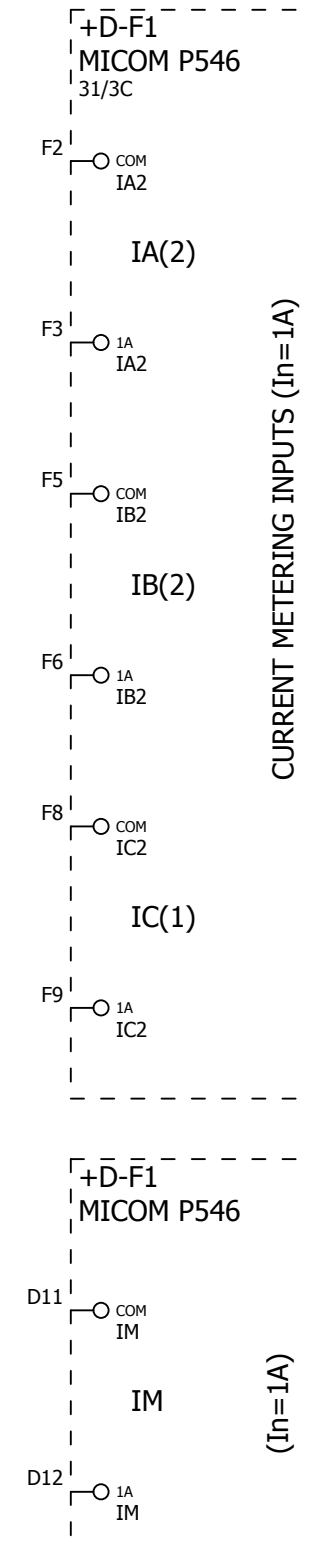
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MiCOM P546 : MULTIFUNCTION LINE DIFFERENTIAL RELAY

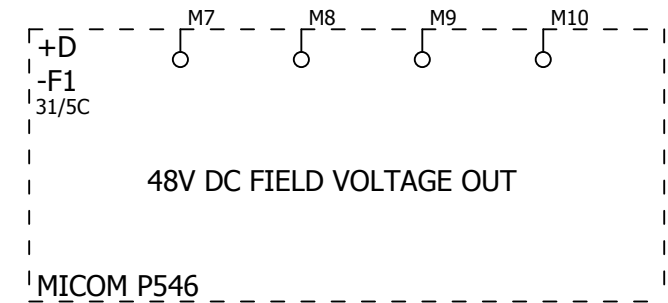


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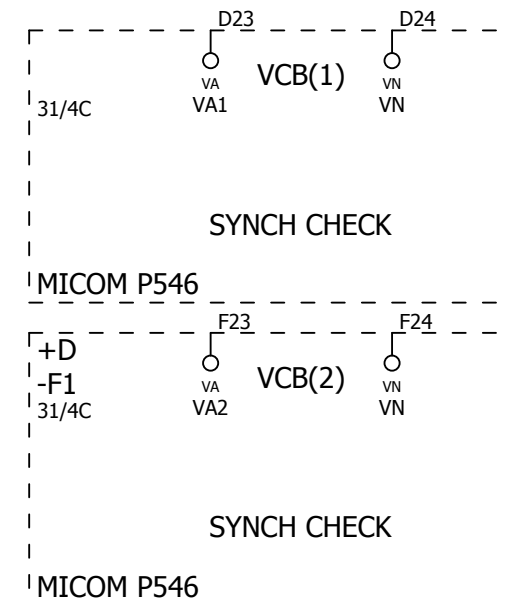
MICOM P546 : ANALOG INPUTS (In = 1A)

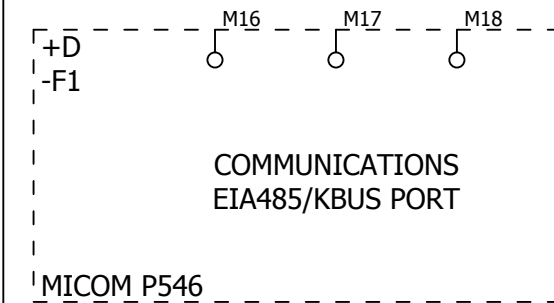


MICOM P546 : 48V DC FIELD VOLTAGE OUT



MICOM P546 : VOLTAGE METERING INPUTS





MiCOM P546

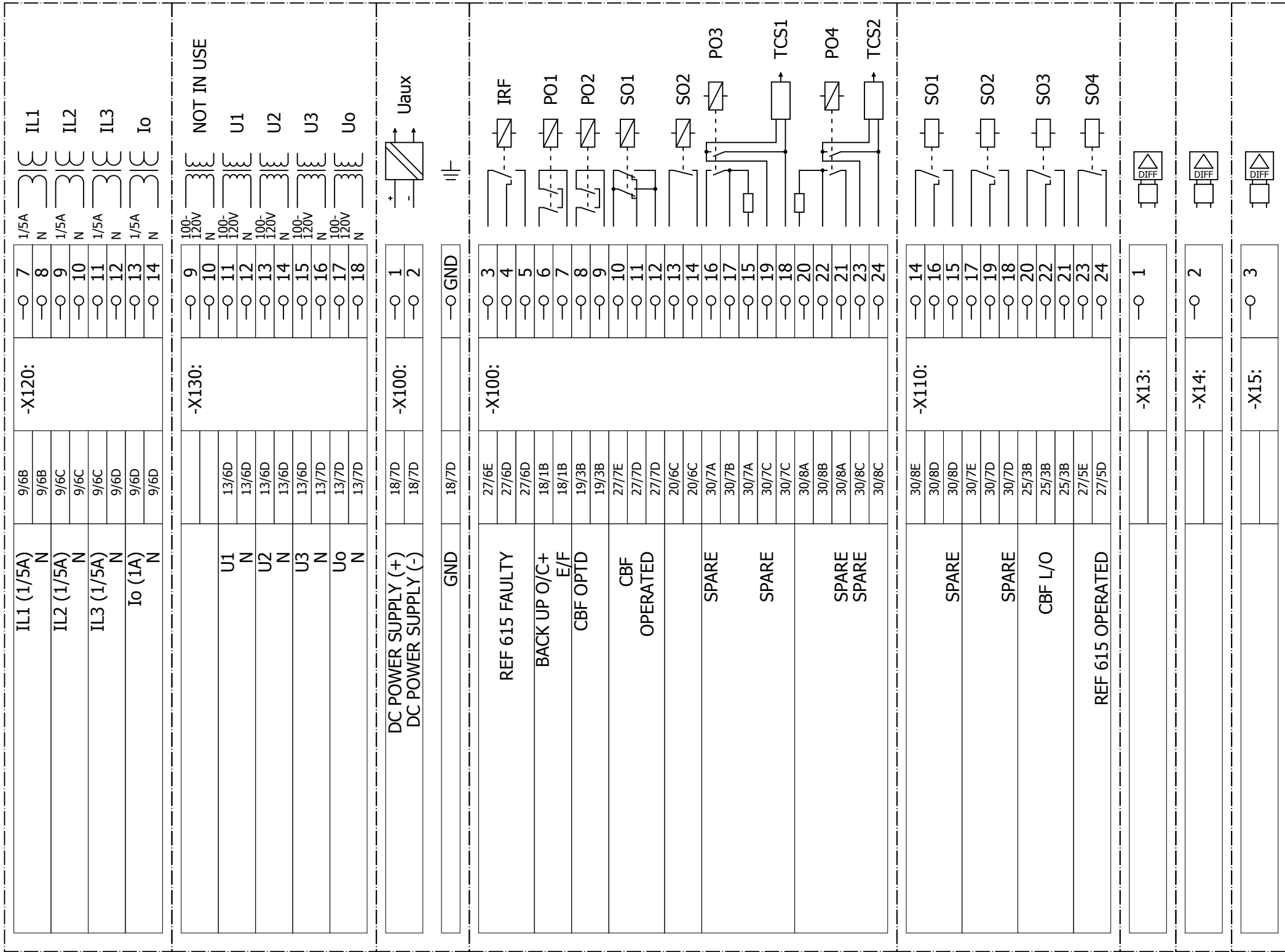
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F

+D-F2

REF 615

REF 615 : BACK UP O/C +E/F RELAY

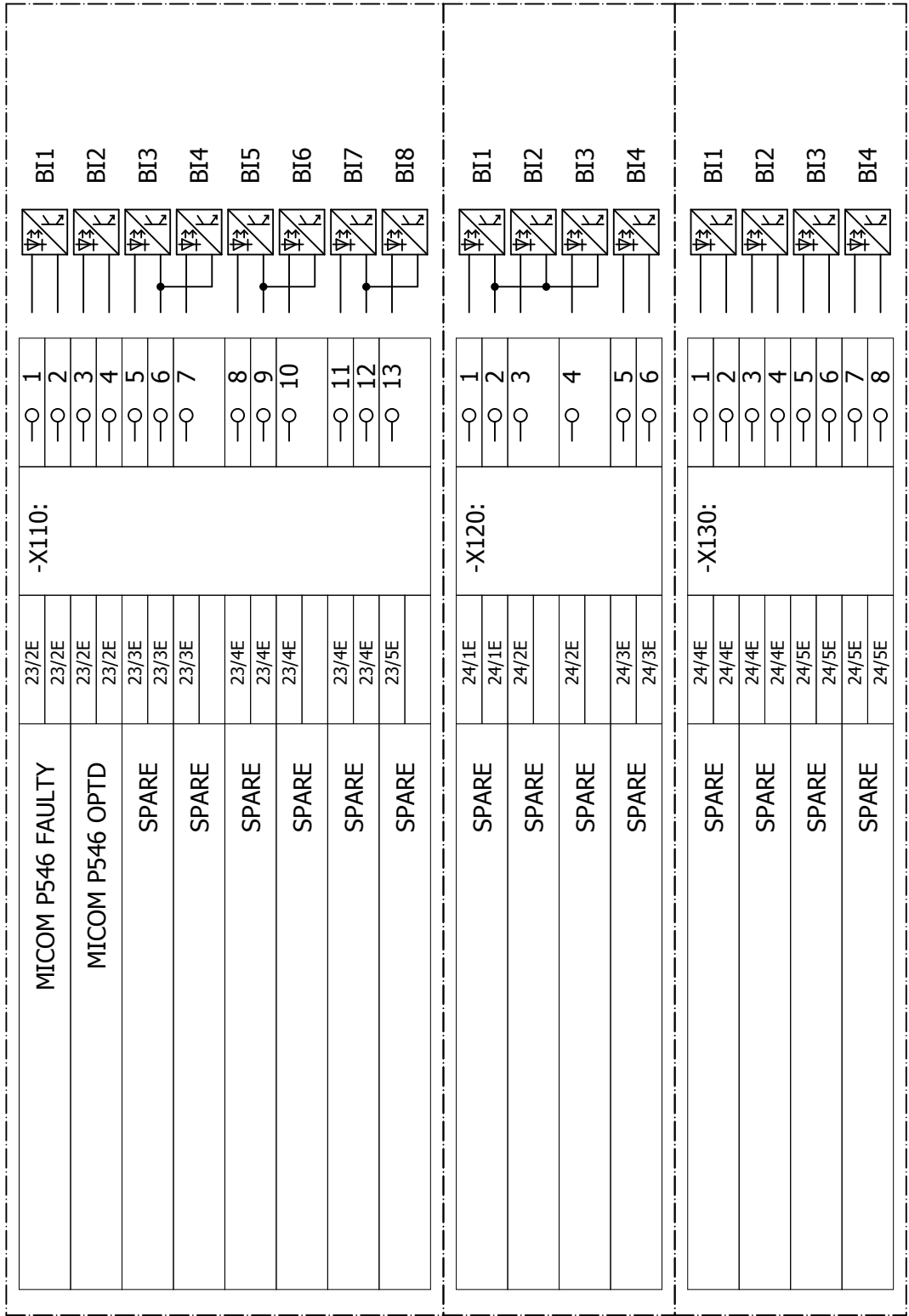


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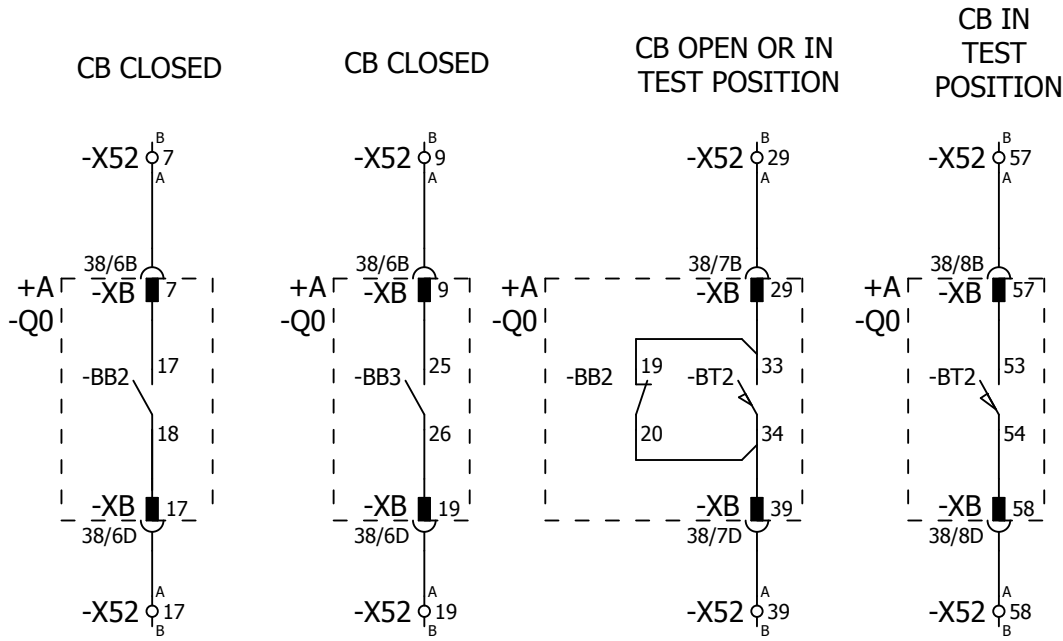
REF 615 : FEEDER PROTECTION AND CONTROL

REF 615



REF 615

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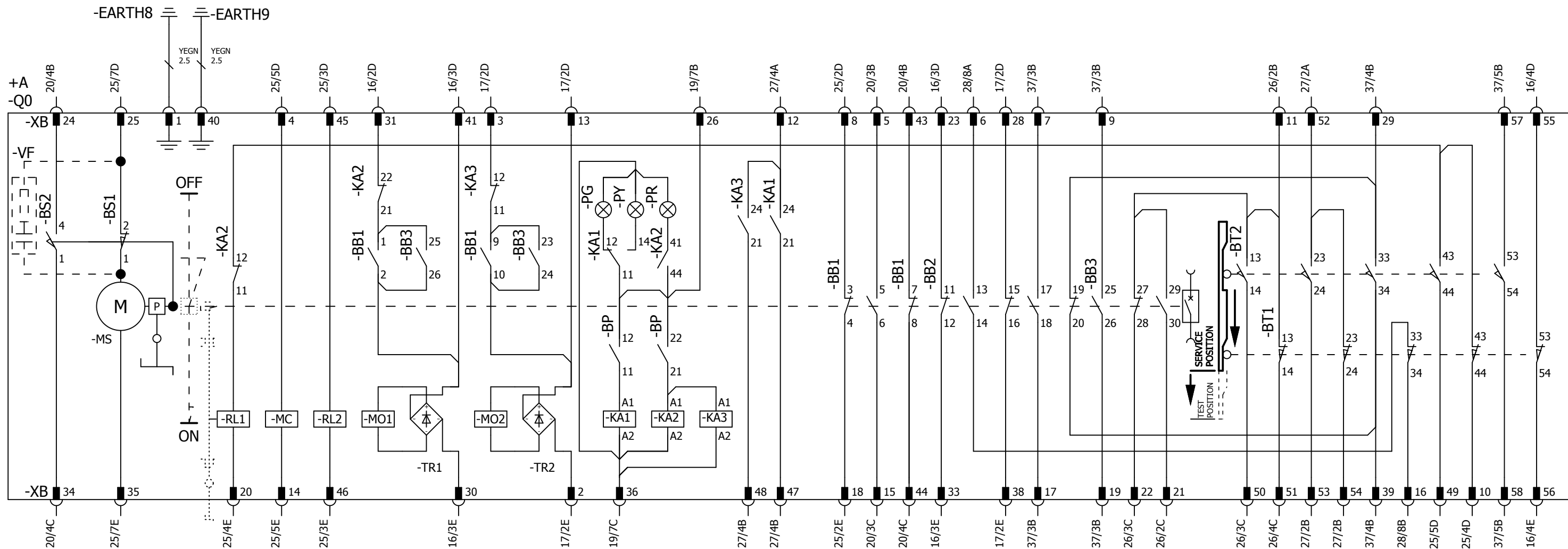
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				Checked Tariq	Approved S.Moin	OUTGOING U/G CABLE FEEDER (1175)	Drg. No. CA-289323	+ E
01	As per comments	Tariq	14/13	Project name 132/33kV # S/S-8501		HD4 SPARE CONTACTS	Design No.	Lang. EN
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HD4

DOC. No: 1VCZ400054

Figures: 1, 2, 3, 4, 7, 9, 14, 22, 32, 51

CB OPEN, TRUCK IN SERVICE POSITION, SPRING NOT CHARGED



SPARE TERMINALS

- X2 ϕ_7^B ϕ_8^B ϕ_9^B ϕ_{10}^B
- X3 ϕ_{12}^B ϕ_{13}^B
- X4 ϕ_{21}^B ϕ_{22}^B ϕ_{23}^B ϕ_{24}^B ϕ_{25}^B
- X5.1 ϕ_{86}^B ϕ_{87}^B ϕ_{88}^B ϕ_{89}^B ϕ_{90}^B ϕ_{91}^B ϕ_{92}^B ϕ_{93}^B ϕ_{94}^B ϕ_{95}^B ϕ_{96}^B ϕ_{97}^B ϕ_{98}^B ϕ_{99}^B
- X7 ϕ_{97}^B
- X7.1 ϕ_1^B ϕ_2^B ϕ_3^B ϕ_4^B ϕ_5^B ϕ_6^B ϕ_7^B ϕ_8^B ϕ_9^B
- X11 ϕ_{15}^B ϕ_{16}^B
- X12 ϕ_{15}^B ϕ_{16}^B
- X13 ϕ_{21}^B ϕ_{22}^B
- X14 ϕ_{12}^B ϕ_{13}^B
- X52 ϕ_{40}^B ϕ_{42}^B ϕ_{47}^B ϕ_{48}^B ϕ_{52}^B ϕ_1^B ϕ_{16}^B ϕ_{27}^B ϕ_{37}^B
- X87 ϕ_9^B ϕ_{10}^B

DESIGNAT.	FIGURE	DESCRIPTION	DESIGNAT.	FIGURE	DESCRIPTION
-MS	Fig.1	MOTOR FOR SPRING CHARGING	-PG	Fig.14	GREEN LED - NORMAL GAS PRESSURE
-BS1	Fig.1	CLOSING SPRINGS DISCHARGED	-PY	Fig.14	YELLOW LED - LOW GAS PRESSURE
-MC	Fig.2	SHUNT RELEASE ON	-PR	Fig.14	RED LED - INSUFFICIENT GAS PRESSURE
-RL1	Fig.3	BLOCKING MAGNET AGAINST CB CLOSING	-BS2	Fig.22	CLOSING SPRING CHARGED
-RL2	Fig.4	BLOCKING MAGNET AGAINST TRUCK MOVING			
-MO1	Fig.7	FIRST SHUNT RELEASE OFF	-BB1	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR1	Fig.7	RECTIFIER FOR COIL -MO1	-BB1	Fig.32	AUXILIARY SWITCH CB SHAFT
-MO2	Fig.9	SECOND SHUNT RELEASE OFF	-BB2	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR2	Fig.9	RECTIFIER FOR COIL -MO2	-BB3	Fig.32	AUXILIARY SWITCH CB SHAFT
-KA1	Fig.14	AUX. RELAY - LOW GAS PRESSURE	-BT1	Fig.51	CB TRUCK IN SERVICE (CONNECTED) POSITION
-KA2	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-BT2	Fig.51	CB TRUCK IN TEST (ISOLATED) POSITION
-KA3	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XB		58-POLE PLUG FOR AUXILIARY CIRCUITS
			-XG		GROUND TERMINALS

				<div><div><div><div></div><div>الشركة الوطنية لنقل الكهرباء</div><div>National Grid SA</div></div></div></div>	Prepared Tariq	Date	30.12.2012	Title	OUTGOING U/G CABLE FEEDER (1175) HD4 INTERNAL WIRING	ABB Job No.	N106931.004	= AG11	
					Checked Tariq	Approved	S.Moin						
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name	132/33kV # S/S-8501 ZS3.2	ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289323	Lang.	EN
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CA-289331

P

C424

11131061/00

JOB ORDER / CONTRACT NO.

INDEX

PLANT NO.

DRAWING NUMBER

REV. NO.

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0407
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 630A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE	DRAWING NO.
XXXXX	XXXXX
XXXXX	XXXXX

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

AS-BUILT	BY	DATE				
01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

نقل الكهرباء

الشركة الوطنية لنقل الكهرباء

الشركة الوطنية لنقل الكهرباء

National Grid

CENTRAL REGION BRANCH

DRAWN BY

Tariq

CHECKED BY

Tariq

SCALE

DATE STARTED

30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED

BY

DATE

COVER SHEET

BUS-D METERING EARTHING

132/33kV # S/S-8501

SAUDI ARABIA

ABB CUBICLE NO.	SEC CUBICLE NO.	EARTH SWITCH NO.				
= AG141D						
ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289331	1 of 34	00

ABB

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DRAWING NUMBER	SHEET NO.	REV. NO.
CA-289331	1 of 34	00

This typical is also valid for: AG141D

S:\SWG Projects DRGS\SEC-COA\N106931-04 SS-8170-8178-8833-8501\Detail Design\8501

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=AG141D+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG141D+E/3	Terminal Block Schedule	00	Original	01	As per comments				
=AG141D+E/4	Single Line Diagram	00	Original	01	As per comments				
=AG141D+E/5	Cubicle Assembly	00	Original	01	As per comments				
=AG141D+E/6	Apparatus List	00	Original	01	As per comments				
=AG141D+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG141D+E/8	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG141D+E/9	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG141D+E/10	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG141D+E/11	ES - INTERNAL WIRING	00	Original	01	As per comments				
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=AG141D+E/13	DC SUPPLY CIRCUITS	00	Original	01	As per comments				
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=AG141D+E/17	87B LOCKOUT RELAY / SUPERVISION	0	Original	01	As per comments				
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=AG141D+E/20	REC670 BINARY INPUTS	0	Original	01	As per comments				
=AG141D+E/21	REC 670 BINARY INPUTS / DC SUPERVISION	0	Original	01	As per comments				
=AG141D+E/22	ES BLOCKING COIL	00	Original	01	As per comments				
=AG141D+E/23	INDICATION CIRCUIT	00	Original	01	As per comments				
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=AG141D+E/29	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG141D+E/30	SPARE CONTACTS	00	Original	01	As per comments				
=AG141D+E/31	SPARE TERMINALS	00	Original	01	As per comments				
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=AG141D+E/33	REC670 - Binary I/O Board	0	Original	01	As per comments				
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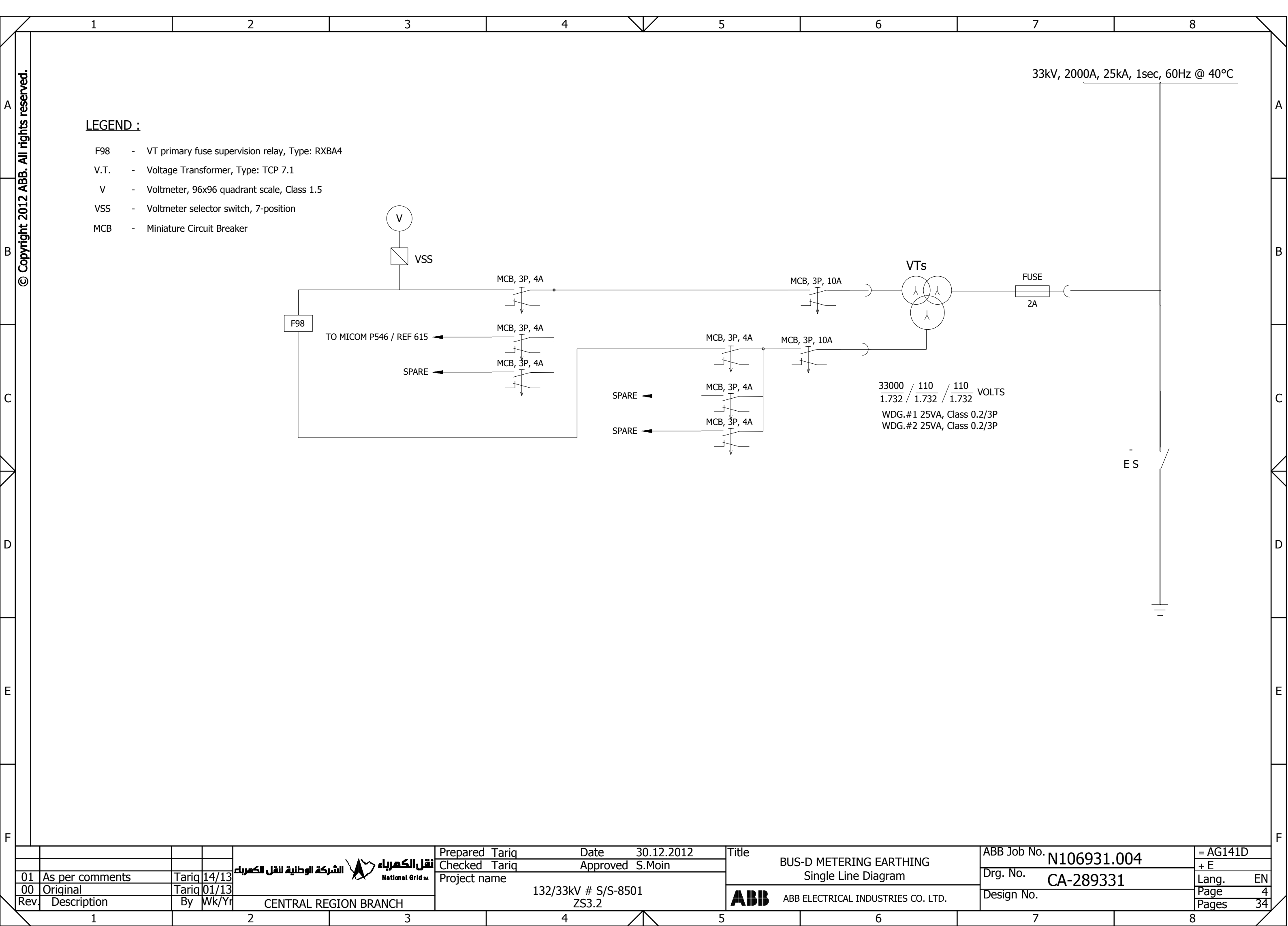
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1		2		3		4		5		6		7		8	
TERMINALS															
NAME	TYPE		REMARK			QUANTITY		FUNCTION							
X3	USST4					13		CONTROL CIRCUIT							
X4	USST4					22		CONTROL CIRCUIT							
X5	USST4					23		CONTROL CIRCUIT							
X7	WTR-4SL					94		SCADA CIRCUIT							
X8	USST4					37		CONTROL CIRCUIT							
X11	OTTA6-T-P/P					10		CT CIRCUIT							
X86						62									
X87	OTTA6-T-P/P					12		CT CIRCUIT							
X2	WTL6SL					35		VT CIRCUIT							

				الشركة الوطنية لنقل الكهرباء National Grid sa		Prepared Tariq Checked Tariq Project name		Date 30.12.2012 Approved S.Moin 132/33kV # S/S-8501 ZS3.2		Title BUS-D METERING EARTHING Terminal Block Schedule ABB ABB ELECTRICAL INDUSTRIES CO. LTD.		ABB Job No. N106931.004 Drg. No. CA-289331 Design No.		= AG141D + E Lang. EN Page 3 Pages 34		
01	As per comments		Tariq	14/13												
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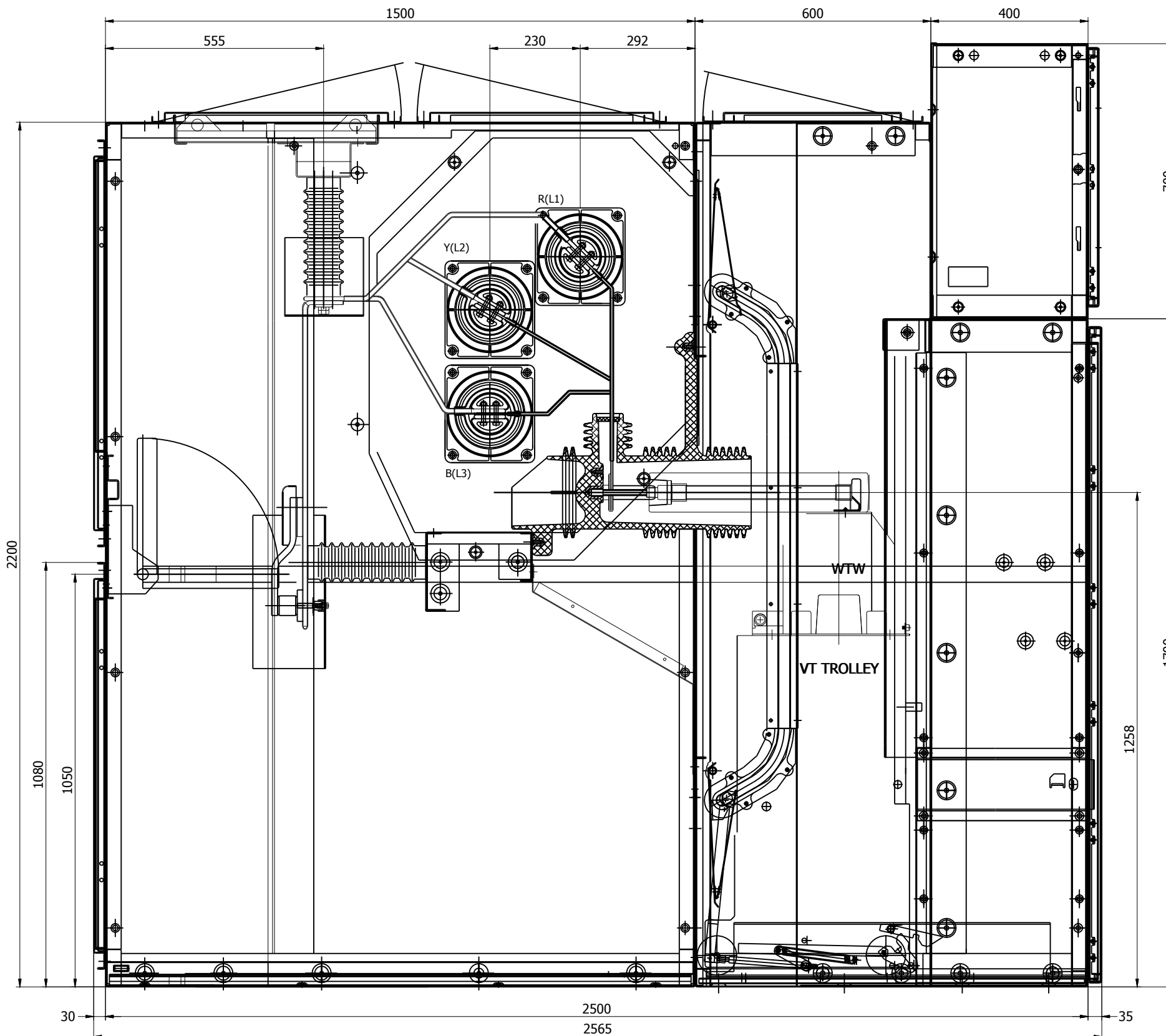
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Checked Tariq	Approved S.Moin
Project name	
132/33kV # S/S-8501	
ZS3.2	

ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.	BUS-D METERING EARTHING Single Line Diagram

ABB Job No.	N106931.004	= AG141D
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				<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title BUS-D METERING EARTHING Cubicle Assembly	ABB Job No.	N106931.004	= AG141D	
					Checked Tariq	Approved S.Moin			Drg. No.	CA-289331	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2						Lang.
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				<div>Checked Tariq</div> <div>Approved S.Moin</div>						<div>Drg. No.</div> <div>CA-289331</div>			<div>+ E</div>		
01	As per comments		Tariq	14/13	<div>Project name</div> <div>132/33kV # S/S-8501 ZS3.2</div>			<div>ABB</div> <div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div>			<div>Lang.</div> <div>EN</div>				
00	Original		Tariq	01/13							<div>Page</div> <div>6</div>				
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National Grid sa

CENTRAL REGION BRANCH

Prepared Tariq

Date 30.12.2012

Checked Tariq

Approved S.Moin

Project name

132/33kV # S/S-8501
ZS3.2

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ABB Job No.

N106931.004

Drg. No.

CA-289331

Design No.

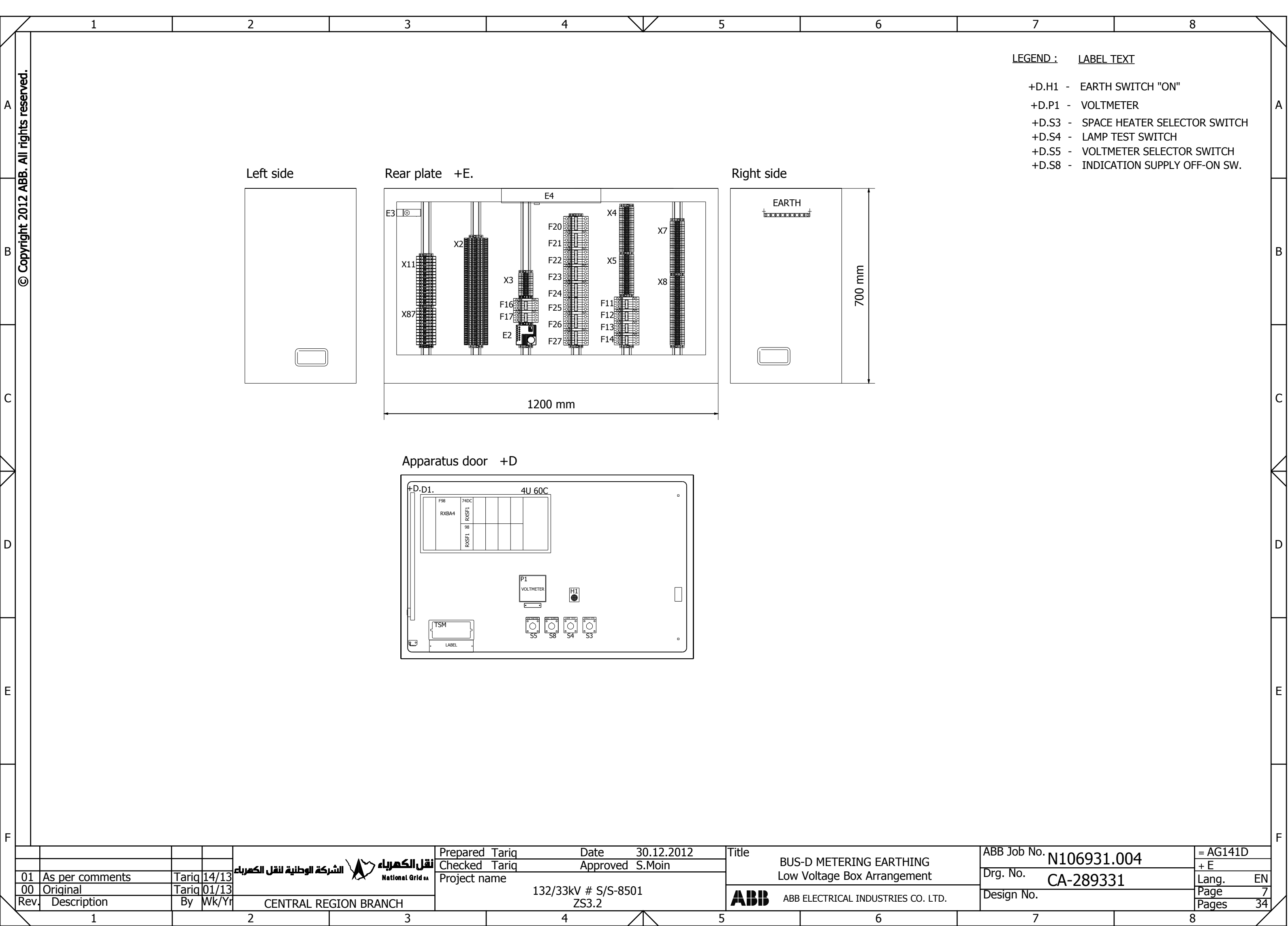
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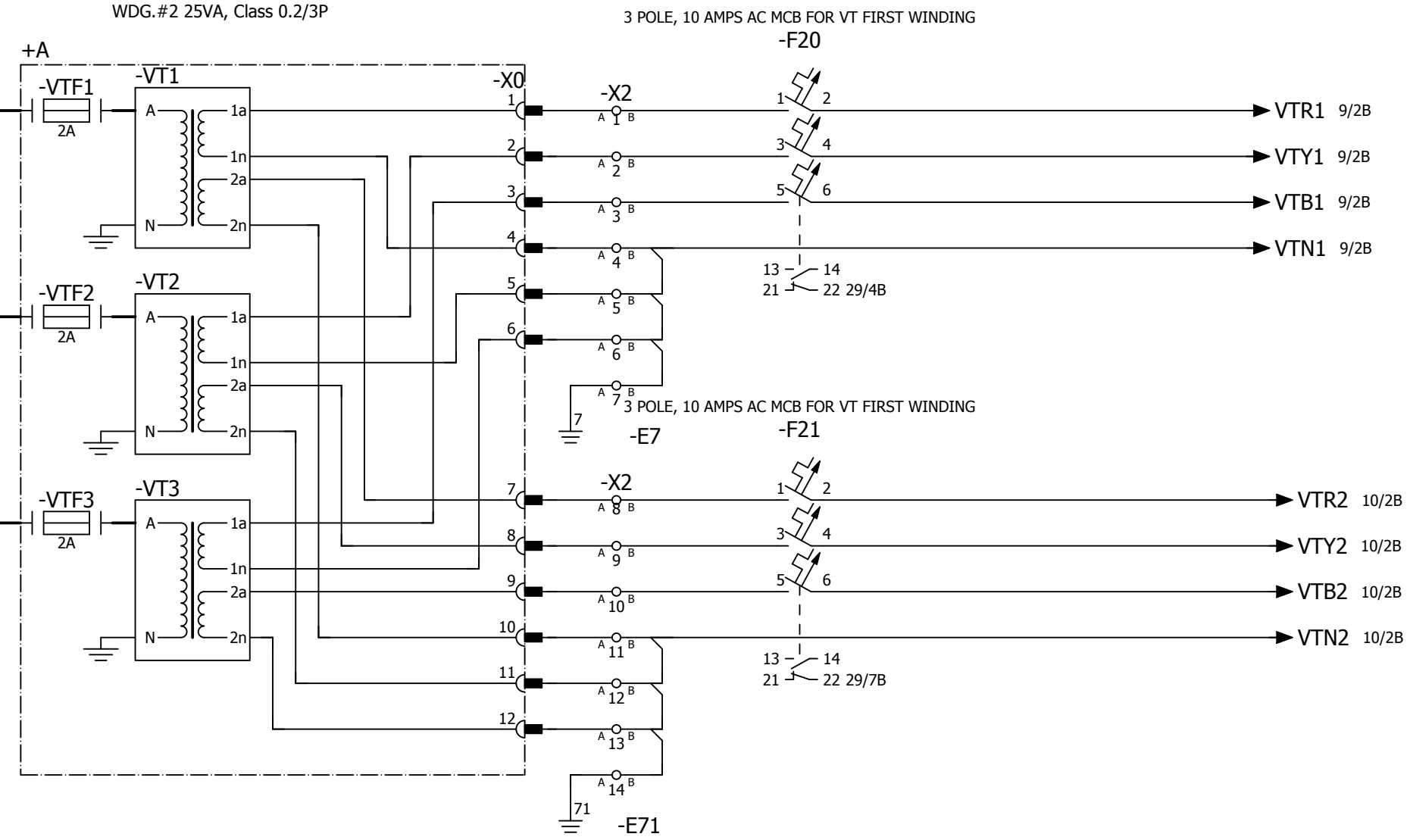
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Withdrawable VT Truck in Cable Compartment

$\frac{33000}{1.732} / \frac{110}{1.732} / \frac{110}{1.732}$ VOLTS
WDG.#1 25VA, Class 0.2/3P
WDG.#2 25VA, Class 0.2/3P



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CONTINUED ON SHEET 13

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					Checked Tariq	Approved S.Moin				+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Drg. No.	CA-289331
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Rev.	Description	By	Wk/Yr		CENTRAL REGION BRANCH			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	

A

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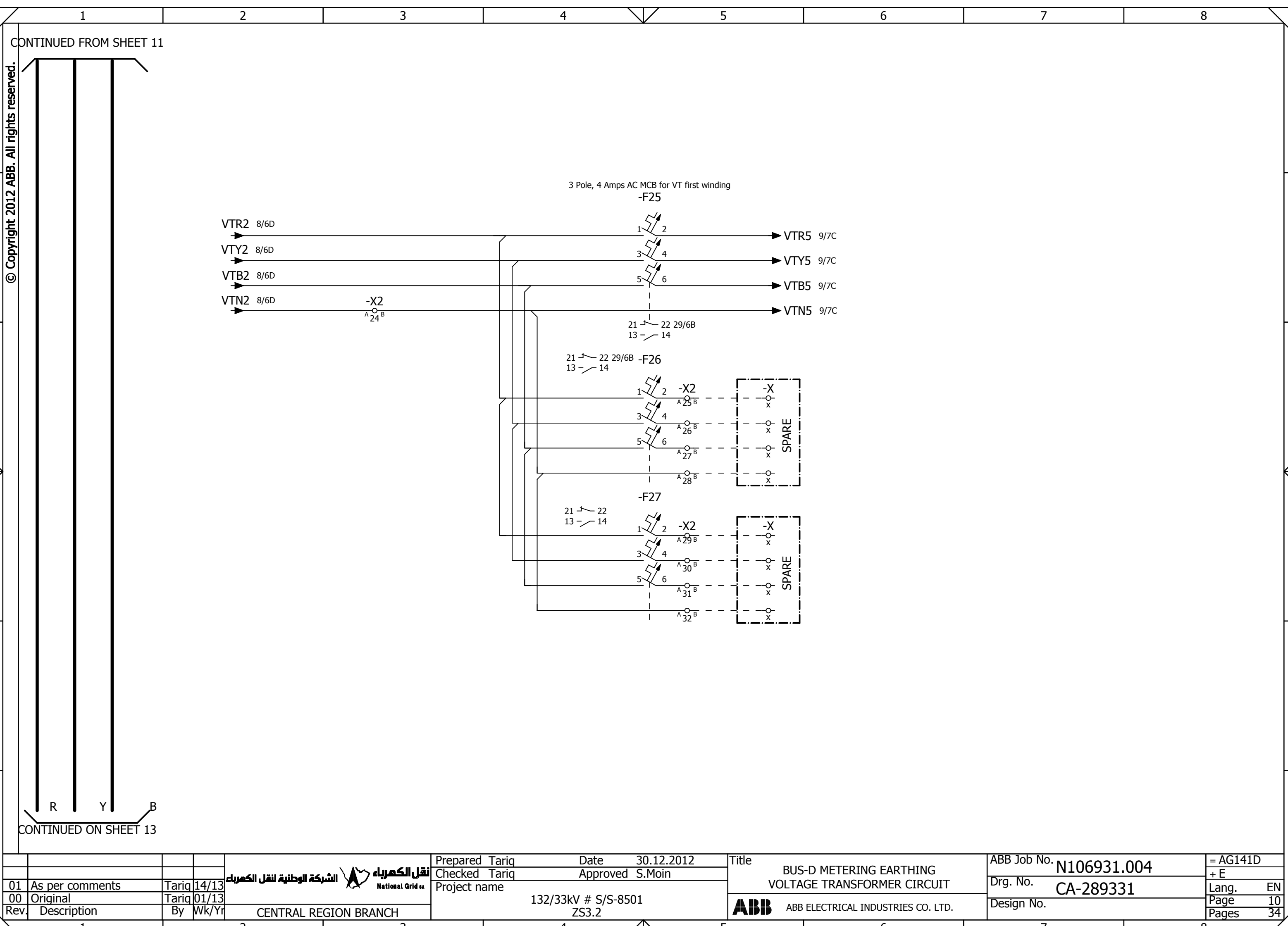
C

D

E



F |

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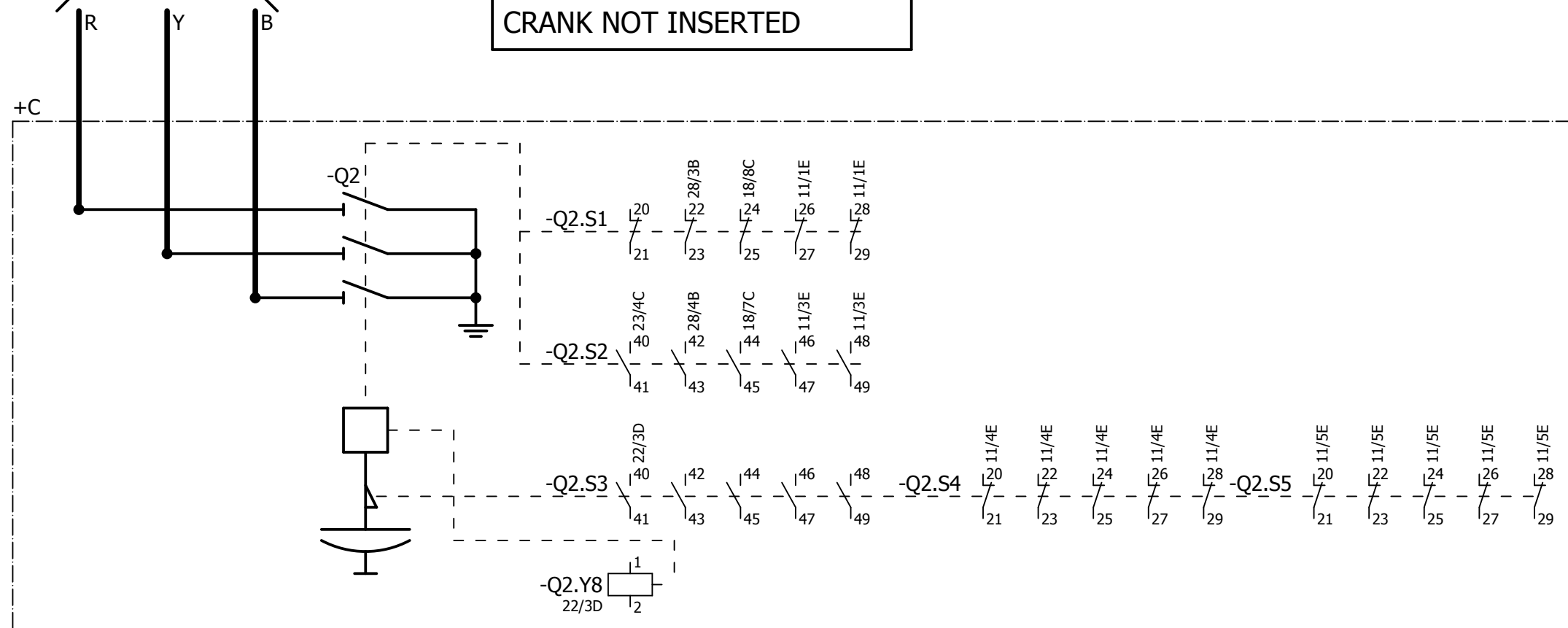
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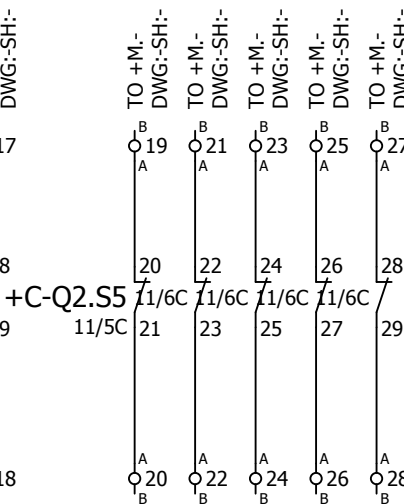
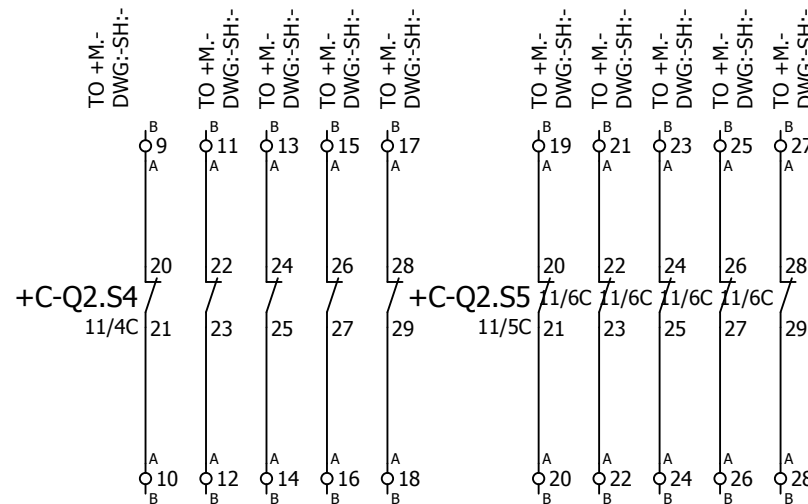
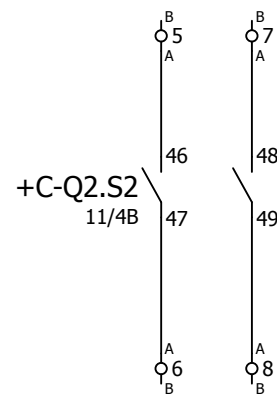
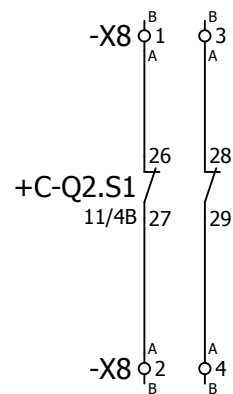
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01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			 ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Lang.
00	Original	Tariq	01/13				Page				10
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH						Pages	34

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EARTHING SWITCH OFF AND CRANK NOT INSERTED





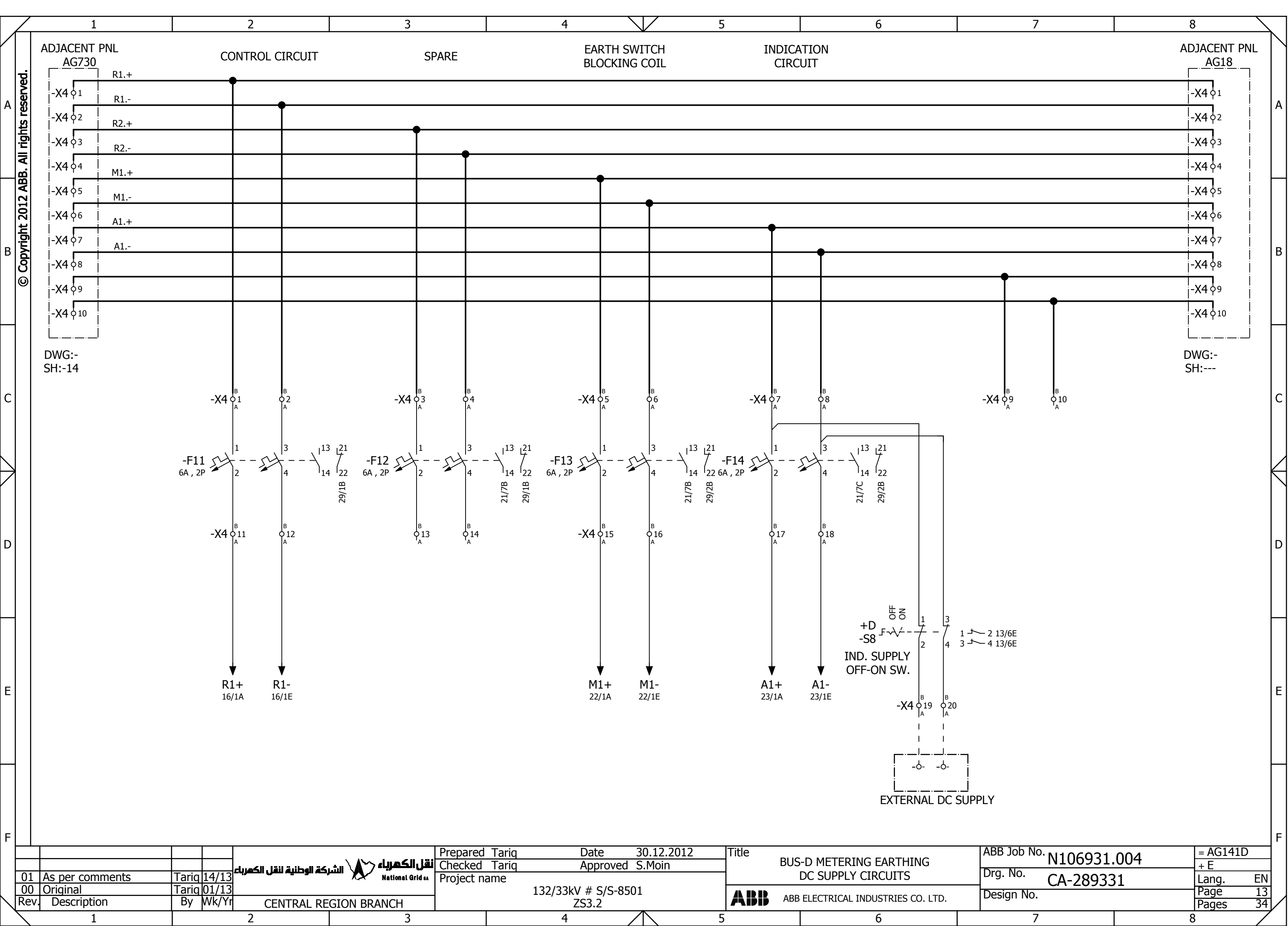
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-Q2.S2	EARTHING SWITCH ON
-Q2.S3	CRANK INSERTED
-Q2.Y8	EARTHING SWITCH BLOCKING COIL
-Q2.S4	EARTHING SWITCH OFF
-Q2.S1	EARTHING SWITCH OFF

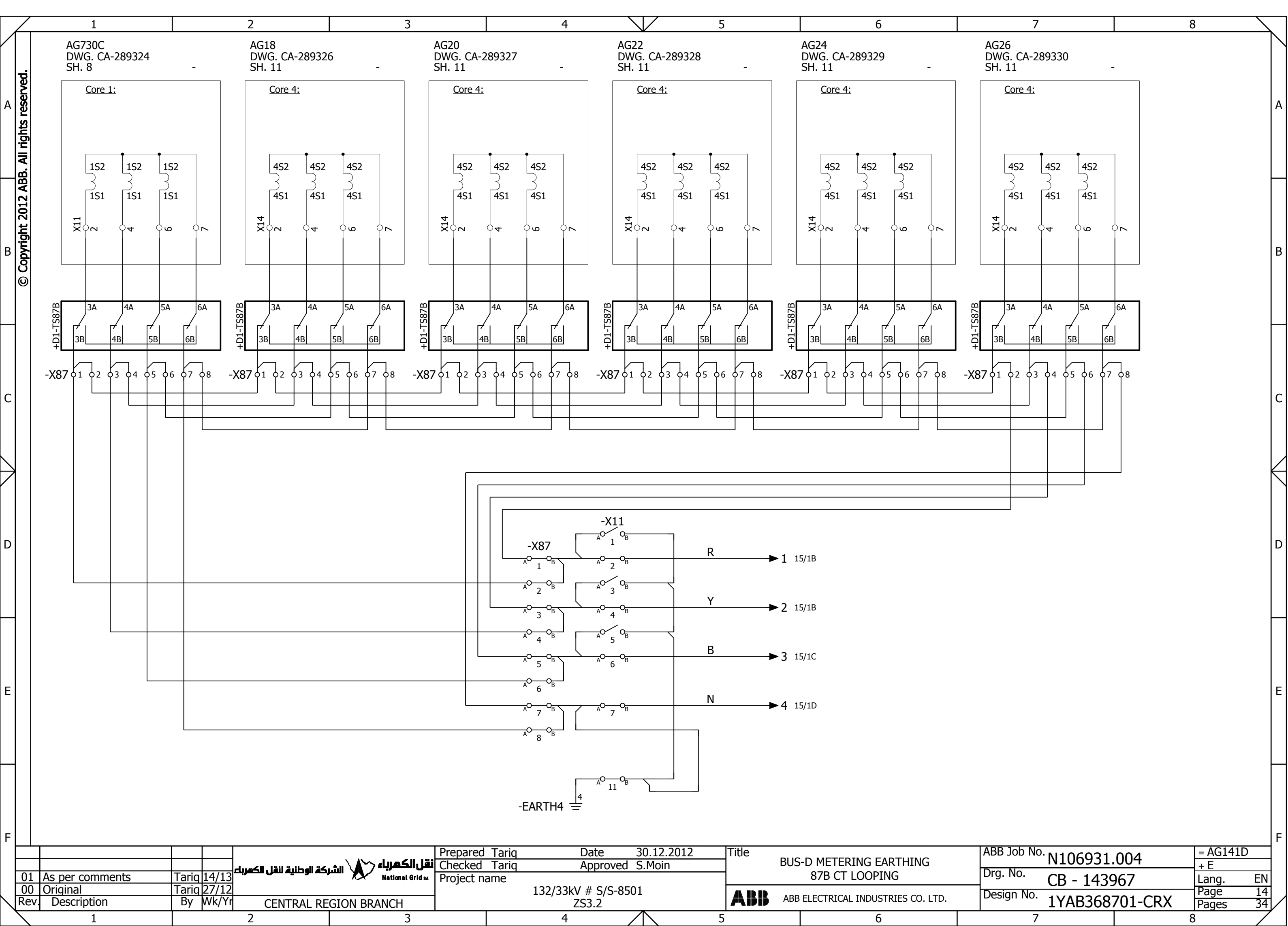




CONTACTS	HAND	0	AUTO
1-2			X
3-4	X		
5-6			X
7-8	X		

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00	Original	Tariq	01/13				132/33kV # S/S-8501 ZS3.2					
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH								Page 12
									Pages 34			





A

B

C

D

E

F

A

B

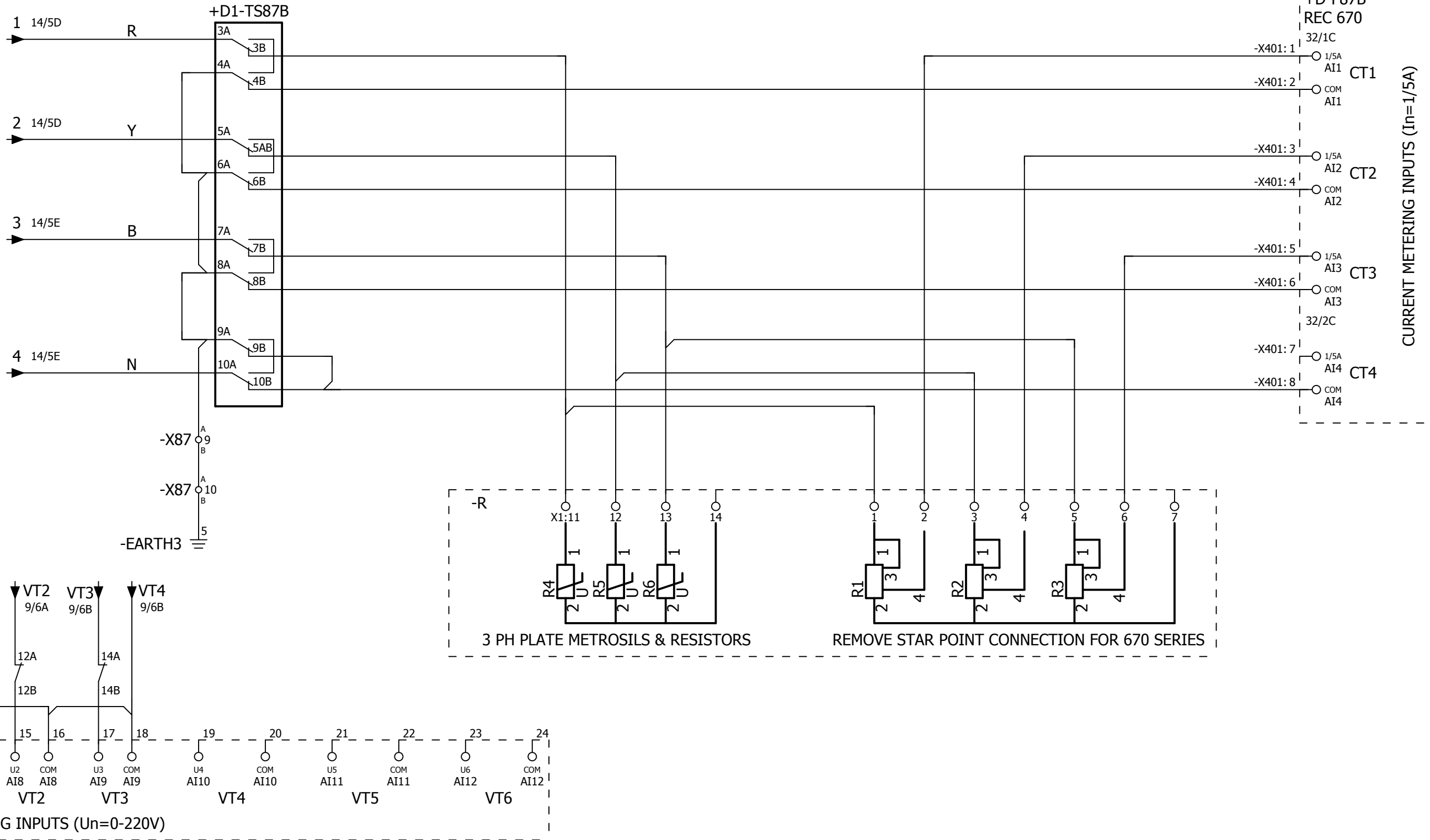
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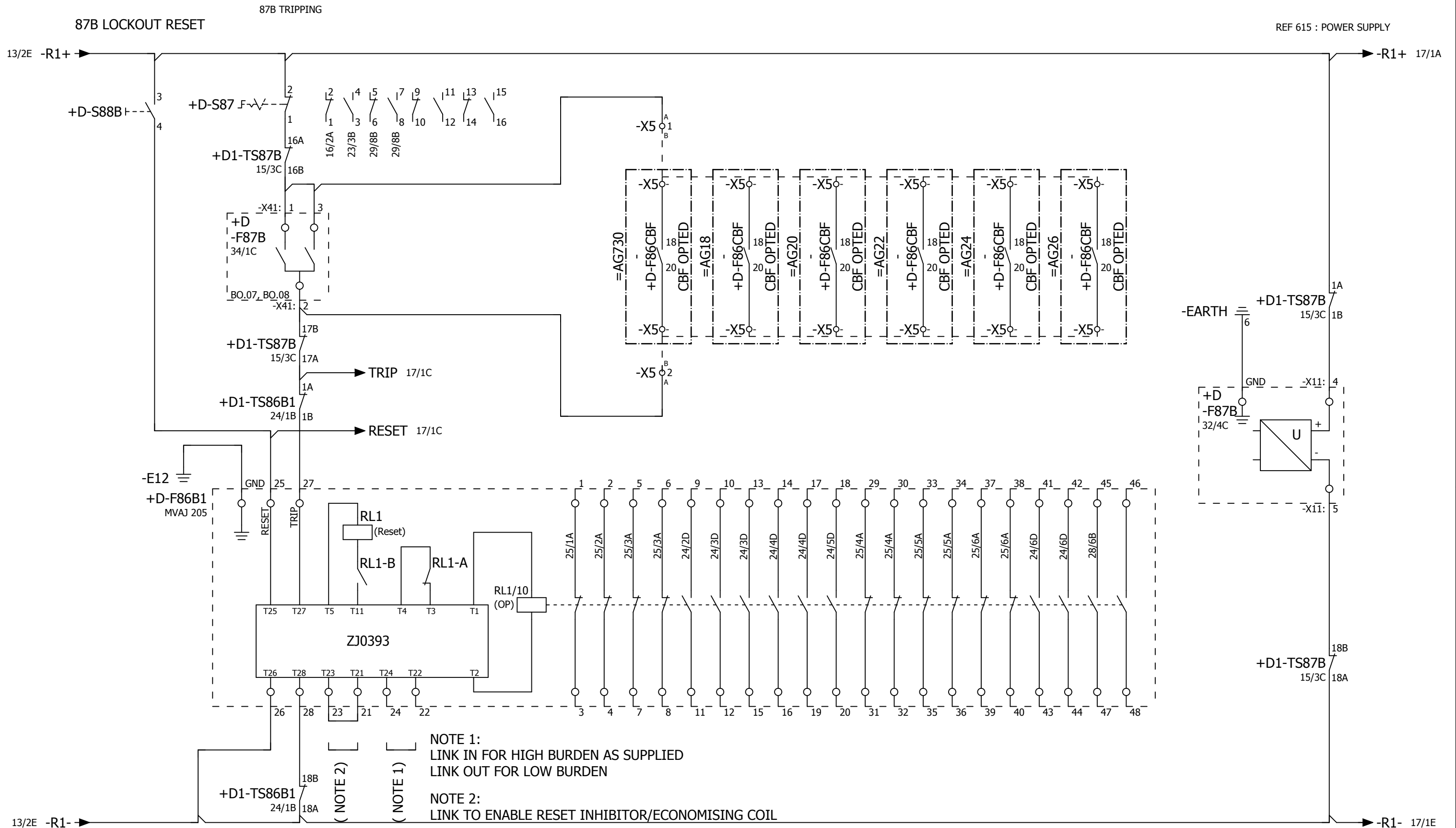
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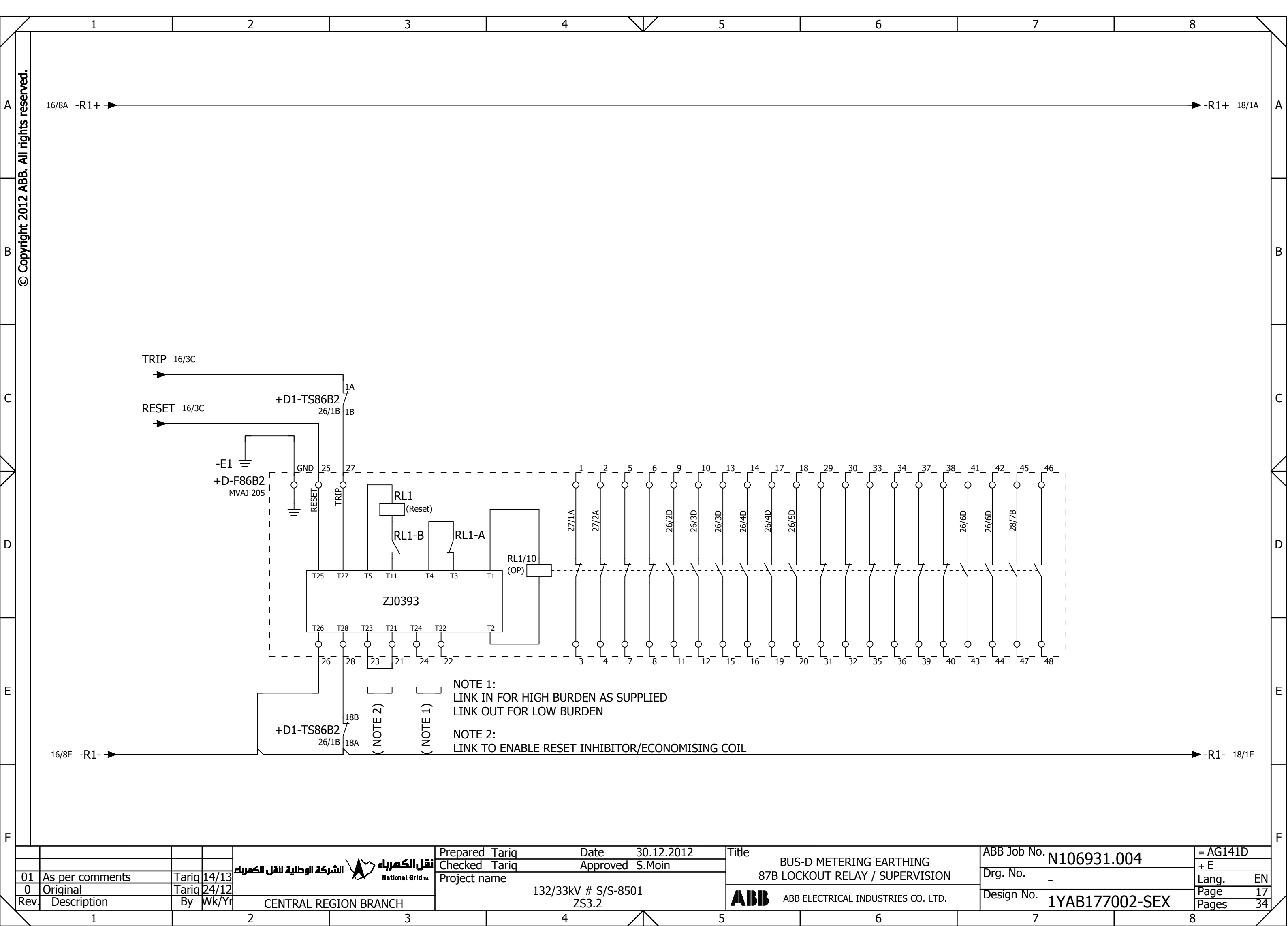
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11A ↗ 11B 15/1E
12A ↗ 12B 15/1E
13B ↗ 13A 28/4B
14A ↗ 14B 15/2E
16A ↗ 16B 16/2B
17B ↗ 17A 16/2C
18B ↗ 18A 16/8E




01 As per comments		Tariq 14/13		Prepared Tariq		Date 30.12.2012		Title		ABB Job No. N106931.004		= AG141D	
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Rev. Description		By Wk/Yr		Project name		132/33kV # S/S-8501		ABB		Design No. 1YAB177002-SEX		Lang. EN	
CENTRAL REGION BRANCH		ZS3.2		ABB ELECTRICAL INDUSTRIES CO. LTD.								Page 15	
												Pages 34	

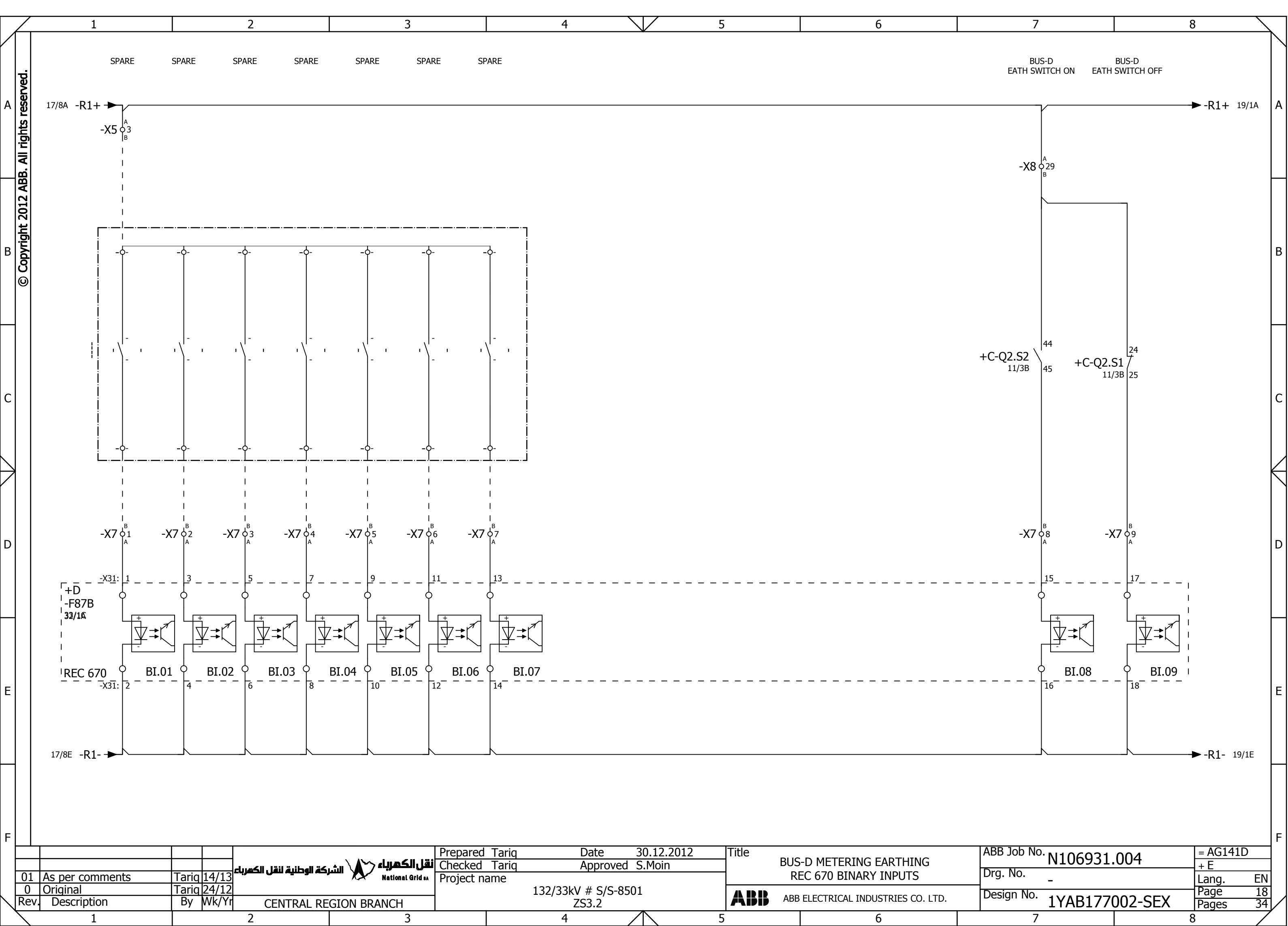


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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH	132/33kV # S/S-8501 ZS3.2			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	1YAB177002-SEX				
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												Pages	34



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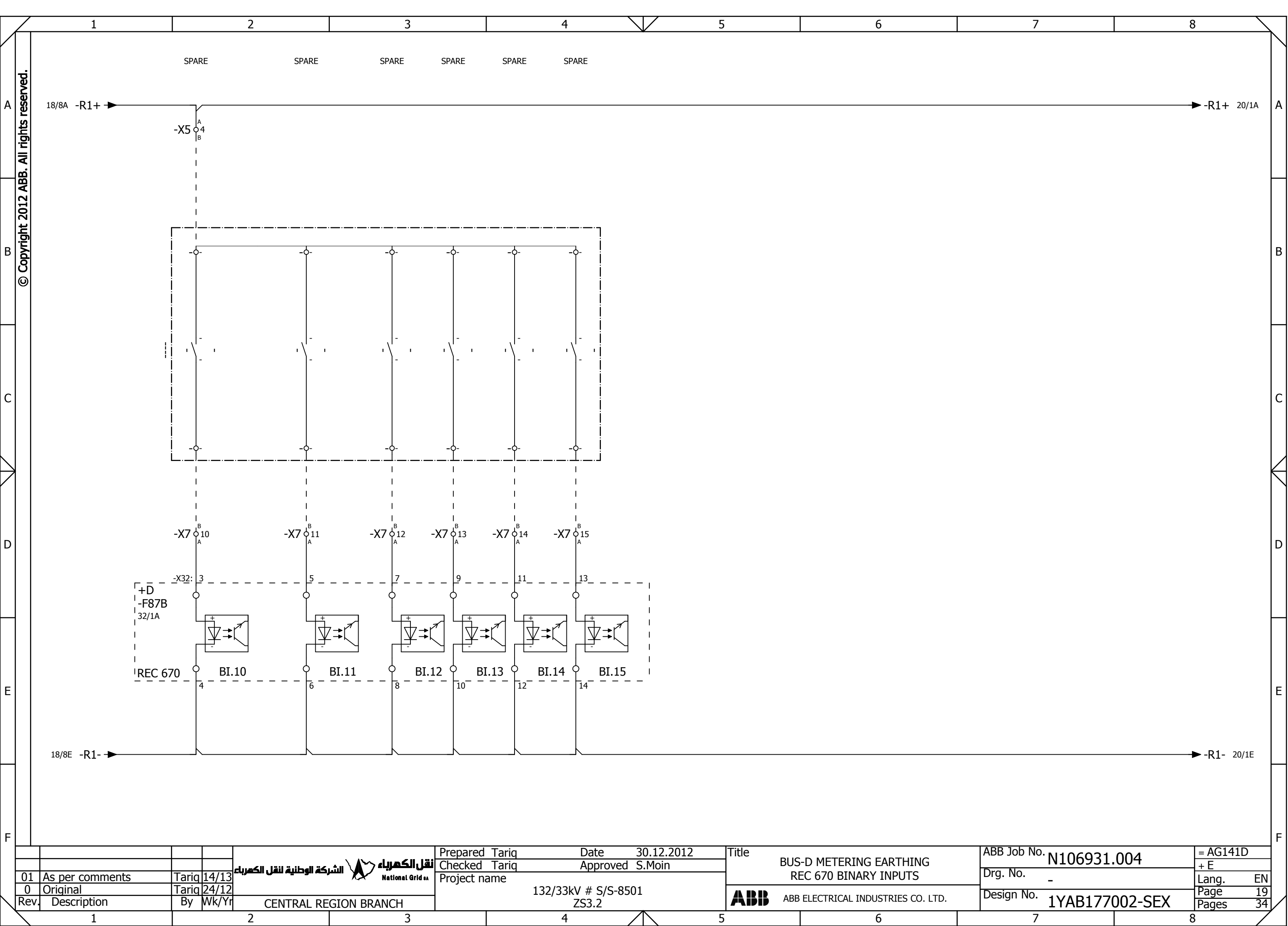
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH			Pages 34		



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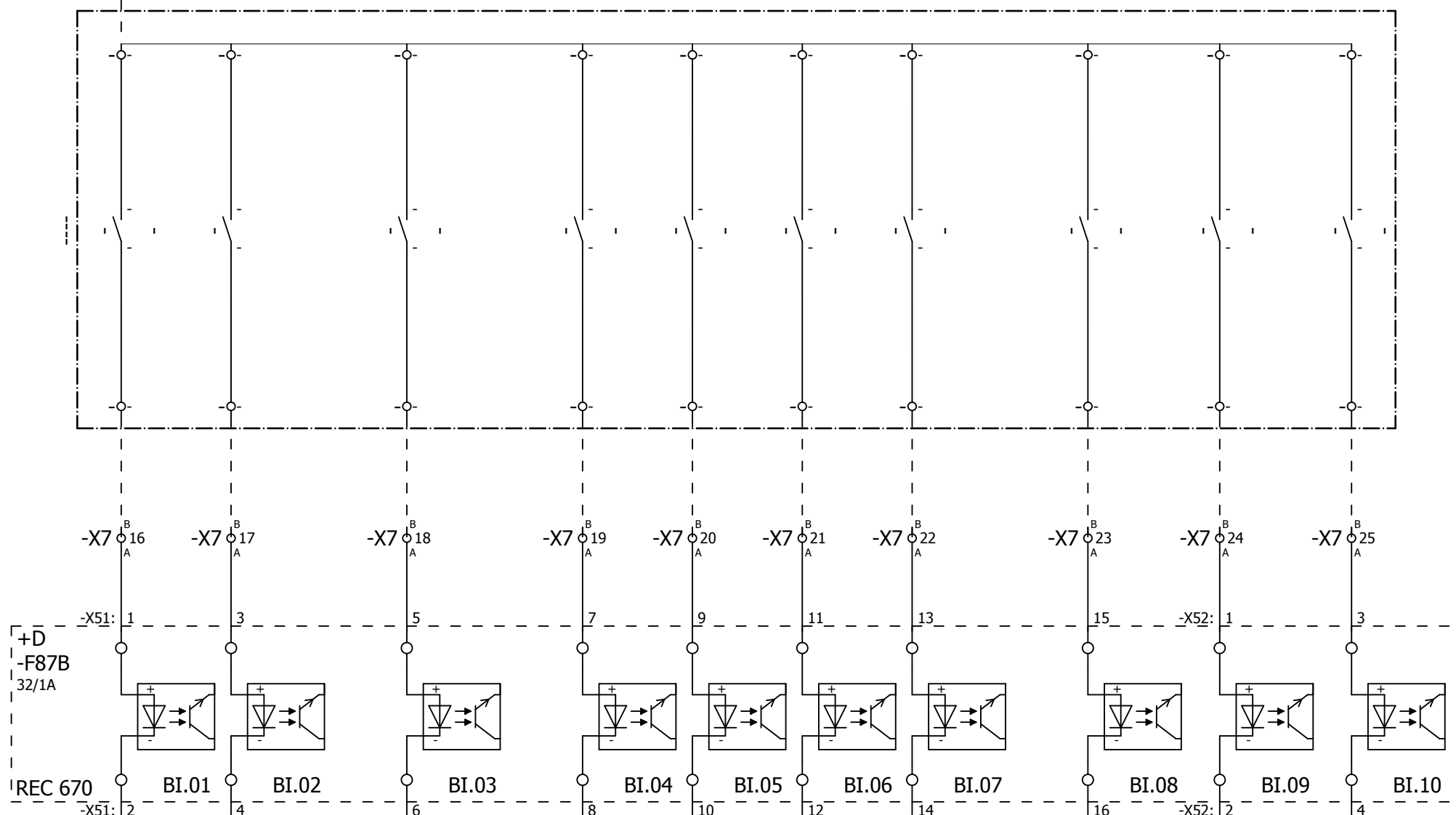
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Rev.	Description	By	Wk/Yr					Pages 34
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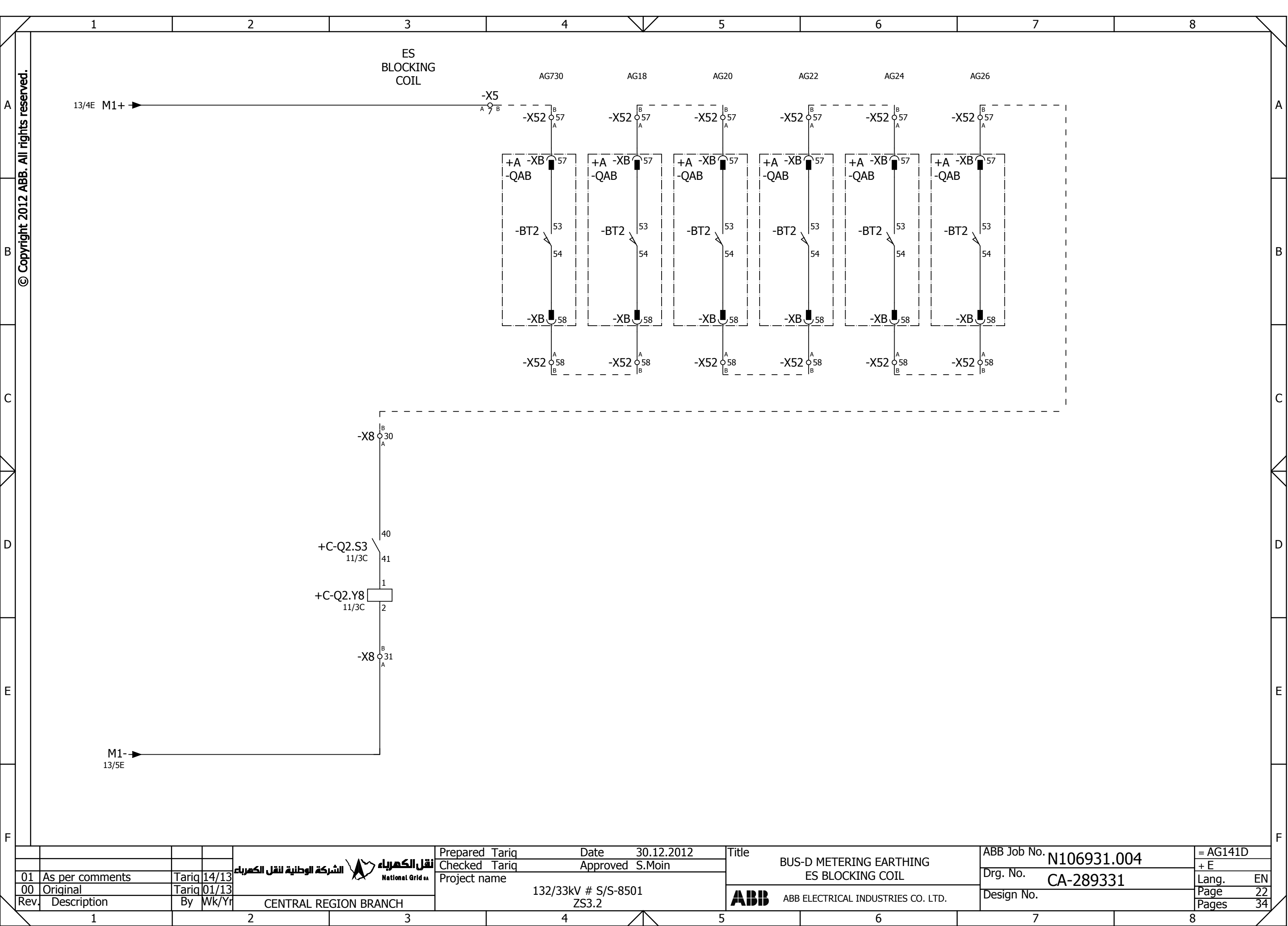
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SPARE




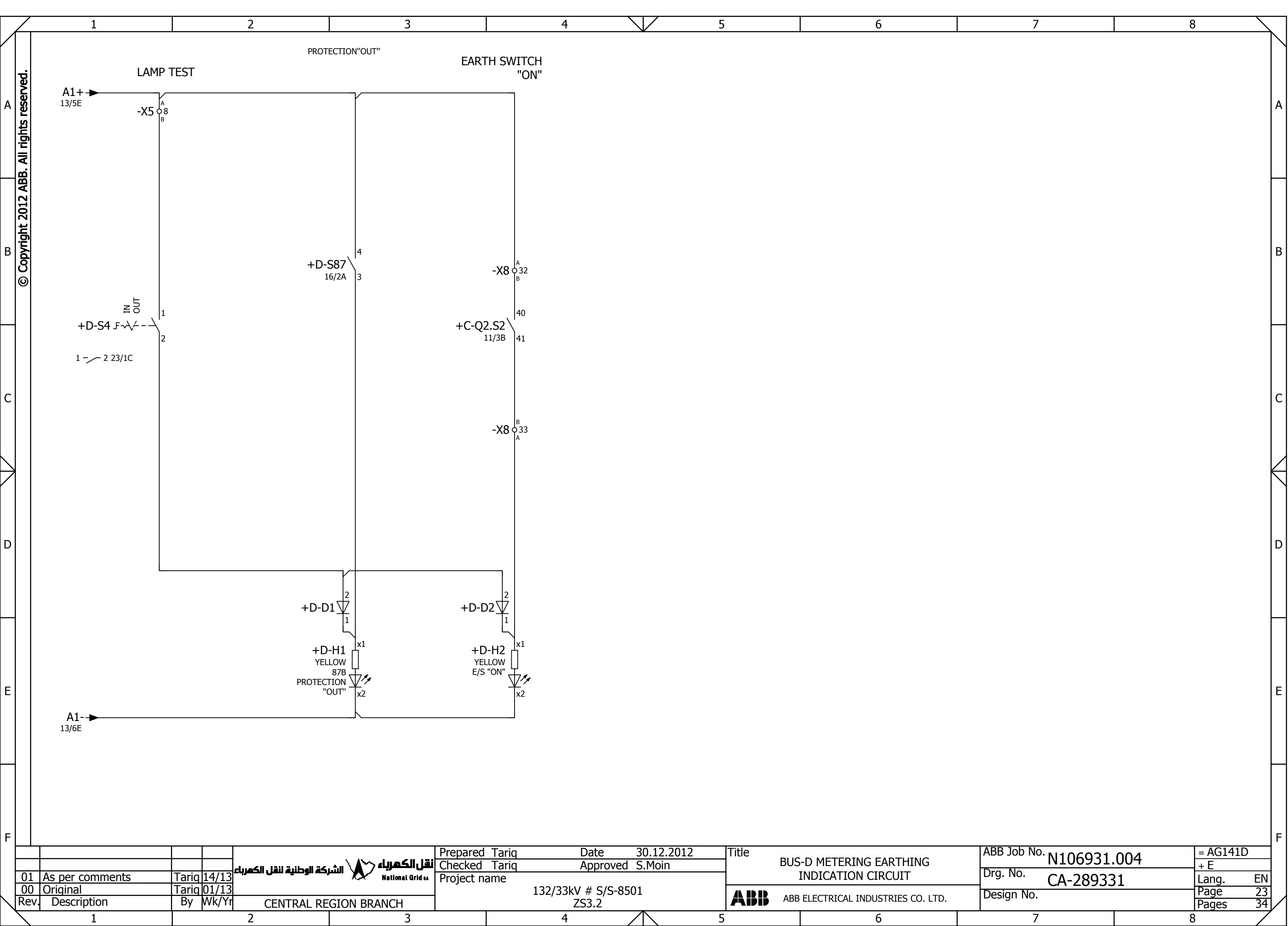
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Pages	34		

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RXSF1		12	2




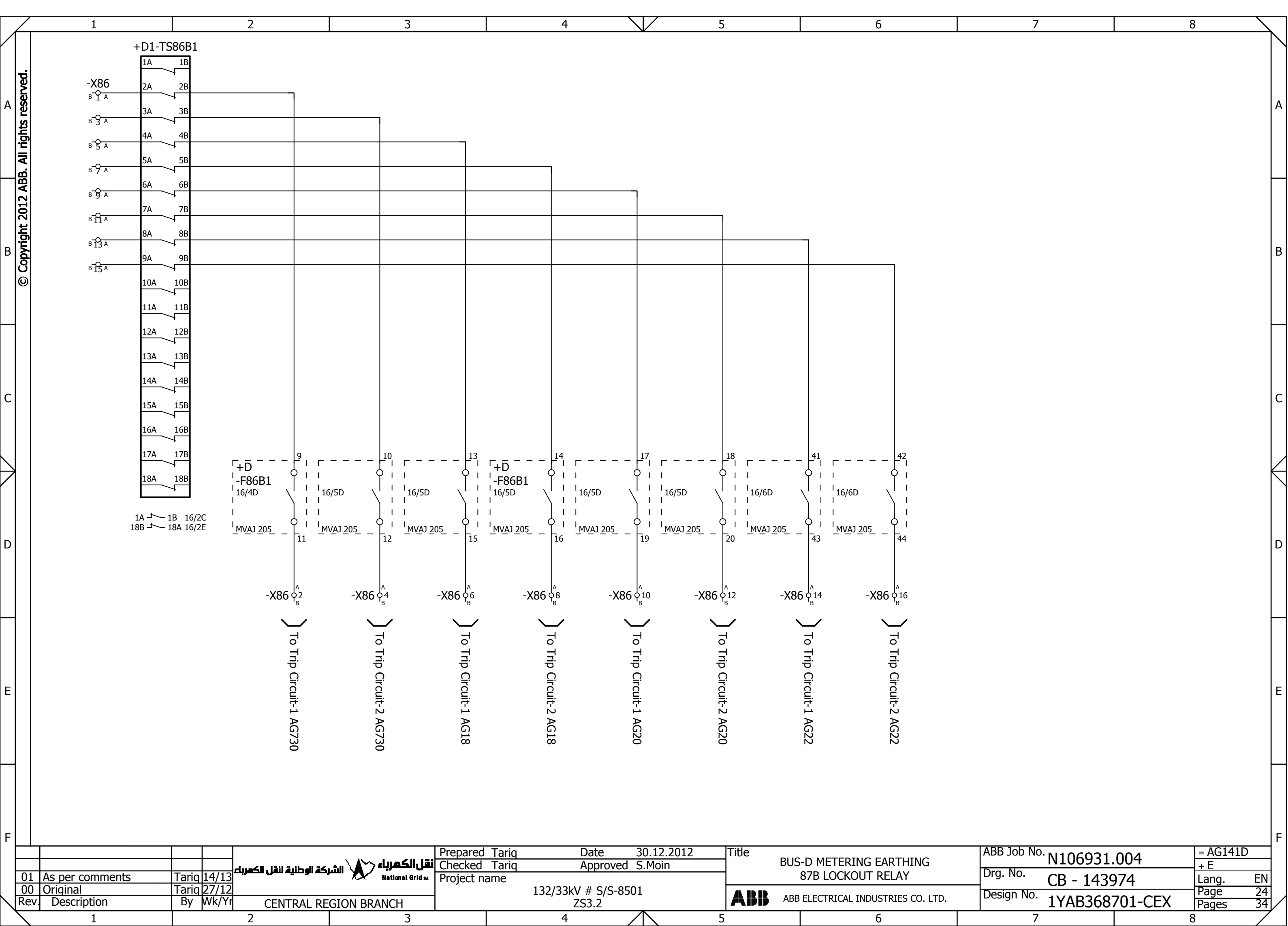
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01	As per comments	Tariq	14/13		Project name	132/33kV # S/S-8501 ZS3.2	<div><div>ABB</div><div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div></div>		Drg. No.	CA-289331	Lang.	EN
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				Design No.		Pages	34	

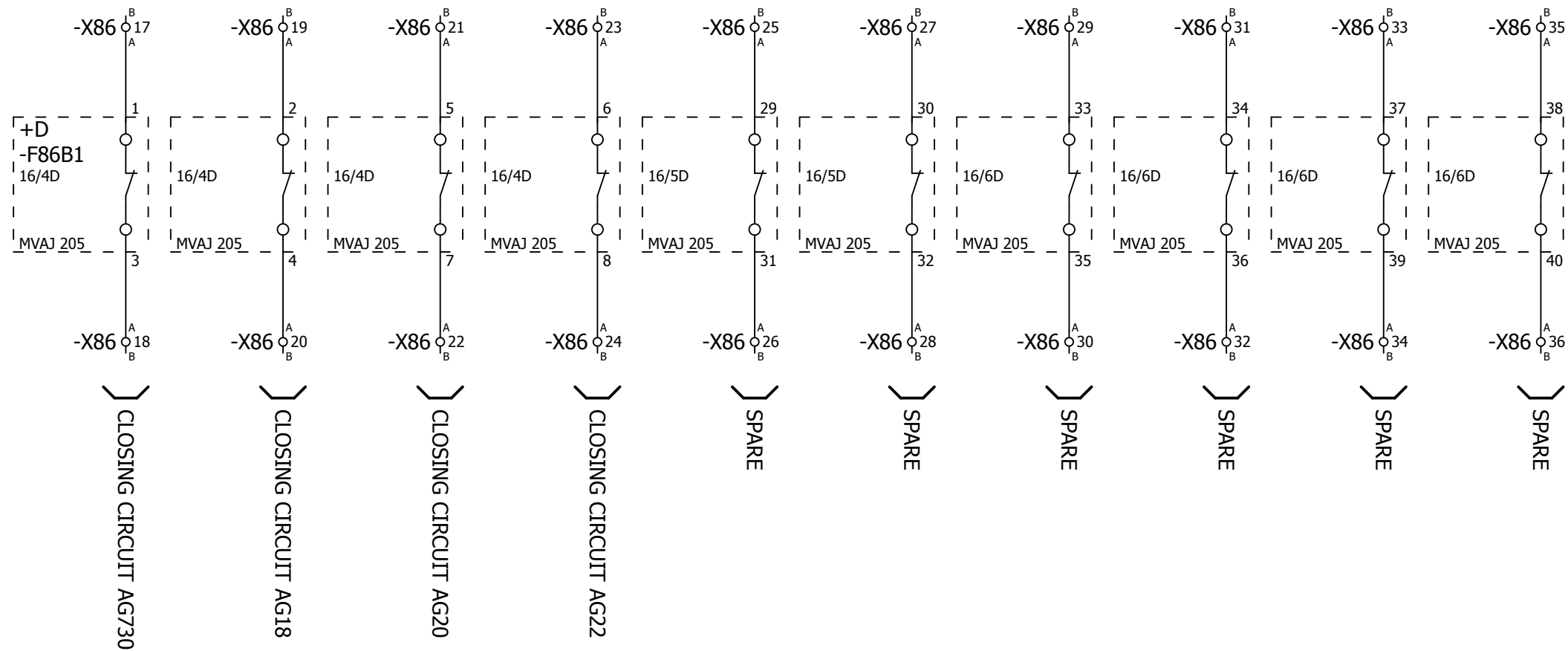



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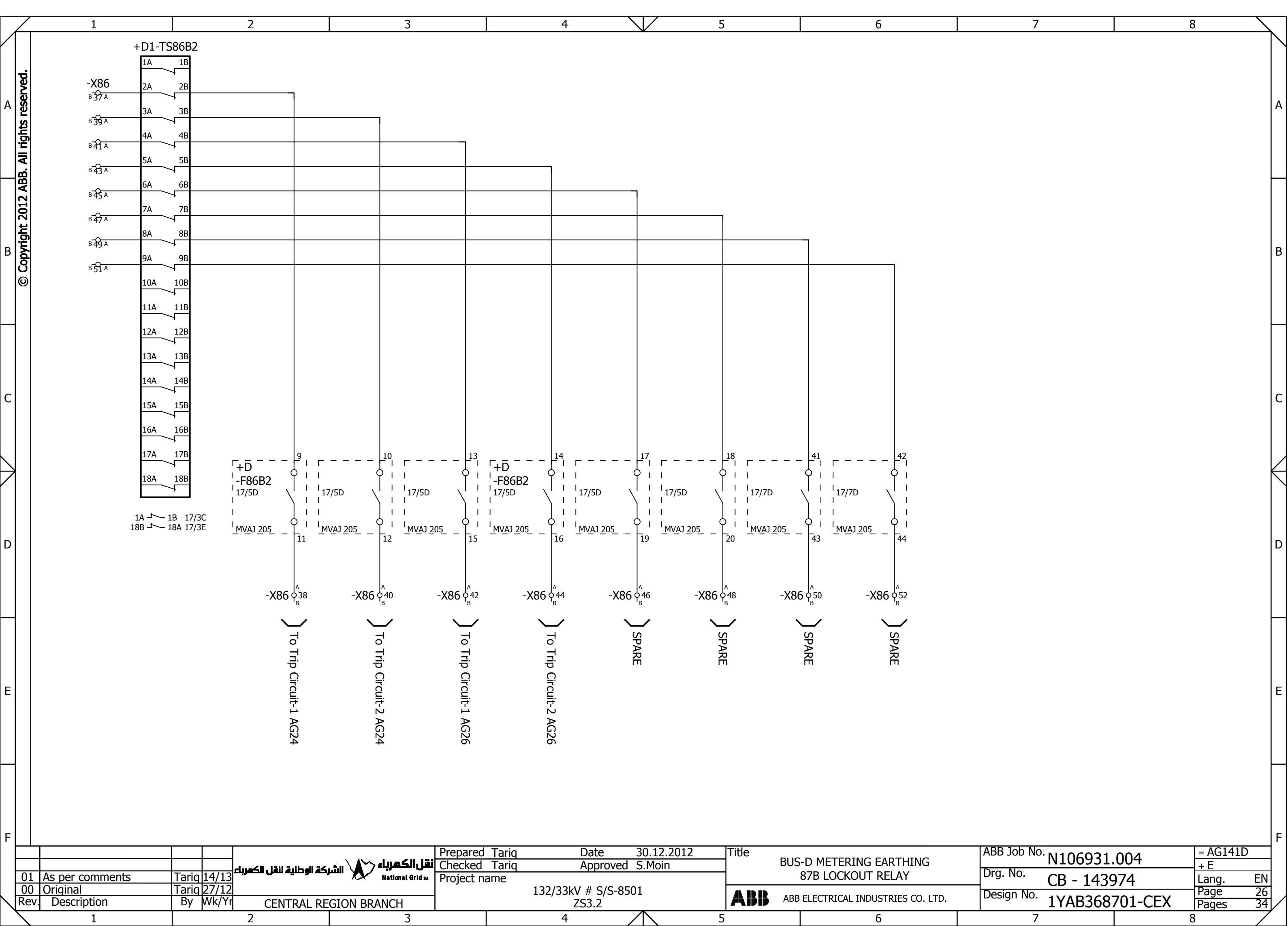
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00	Original	Tariq	01/13						
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH	ABB ABB ELECTRICAL INDUSTRIES CO. LTD.			Design No.	Page 23 Pages 34



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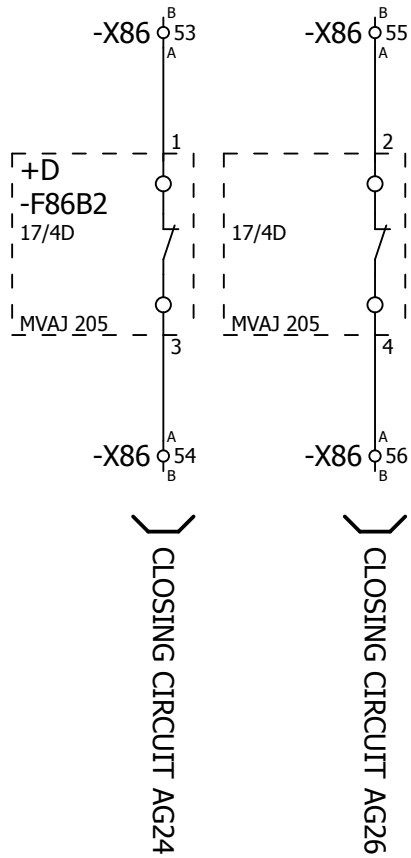
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Pages 34




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00	Original	Tariq	27/12					Page 26
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				Pages 34

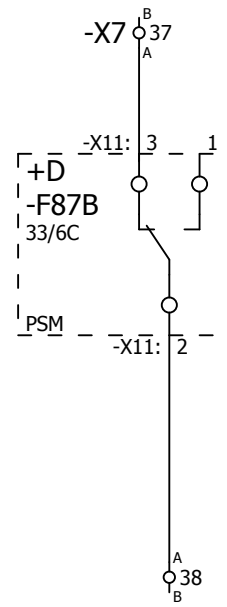
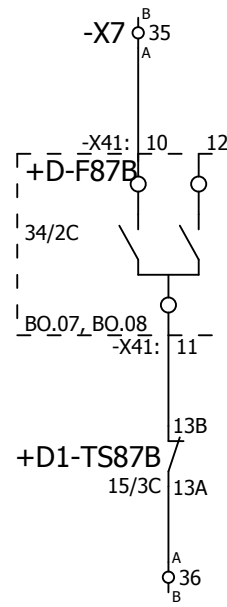
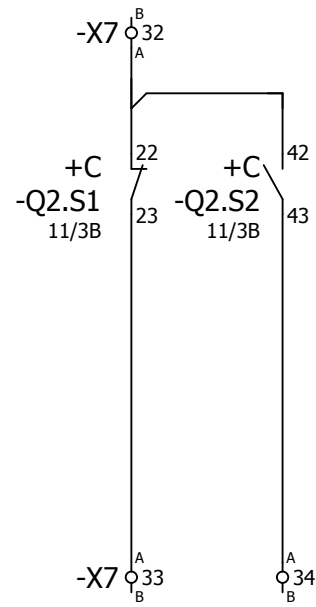
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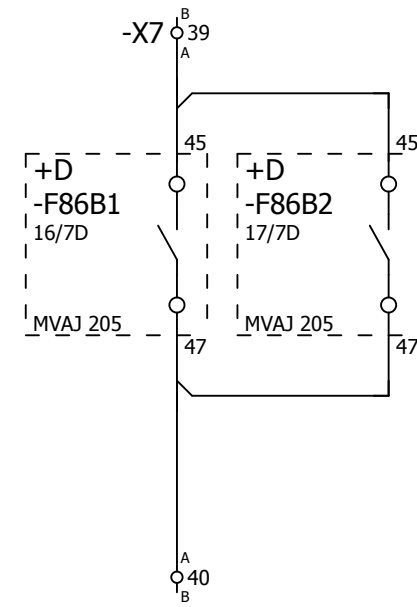
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Pages 34	

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EARTH
SW. OFF EARTH
SW. ON

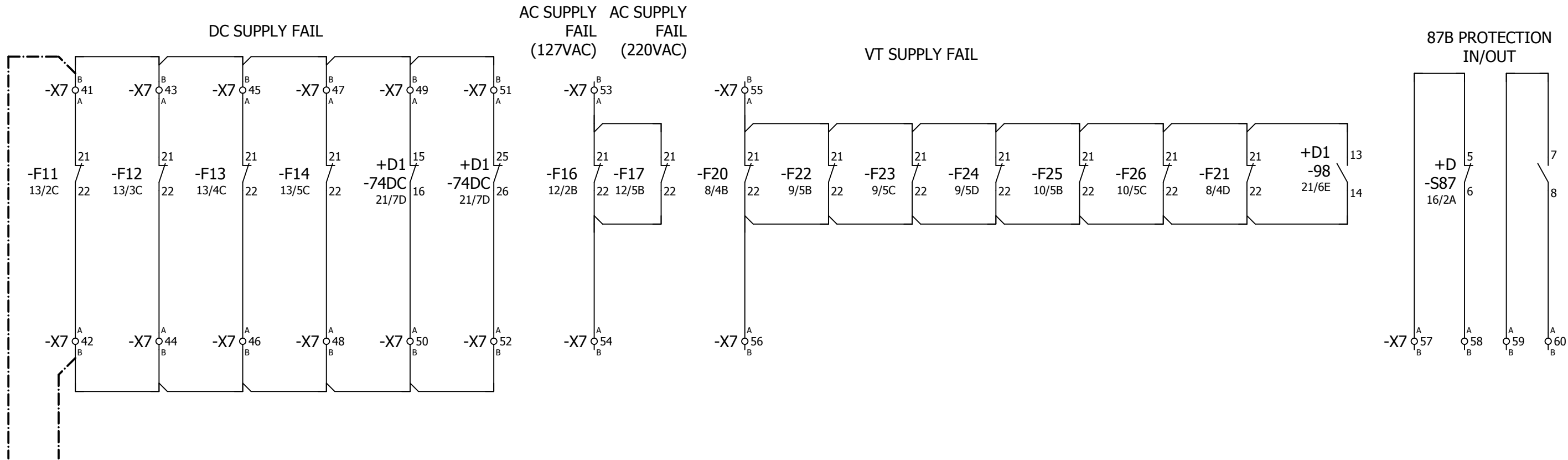


87B LOR OPERATED



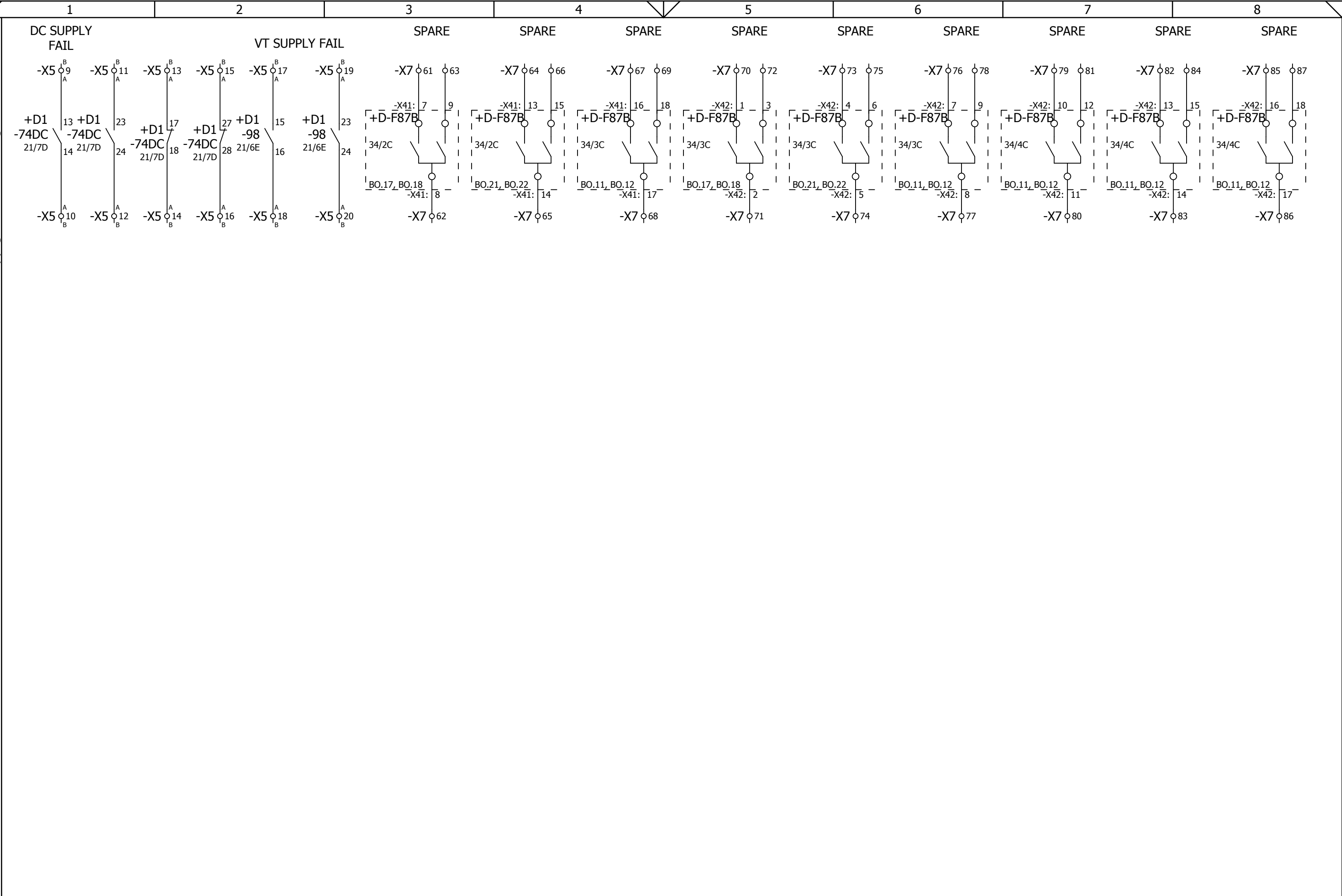
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				Pages 34



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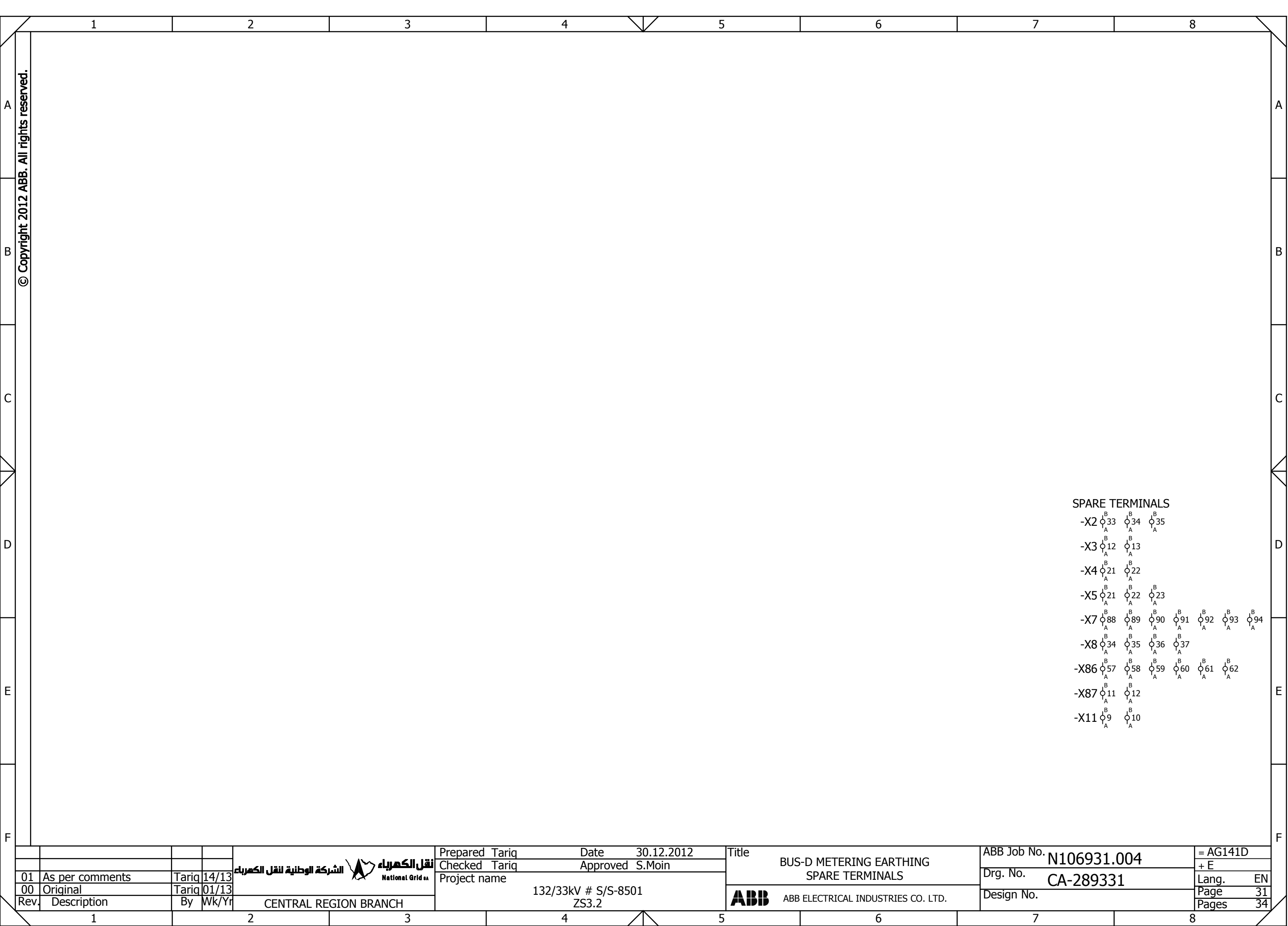


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00	Original	Tariq	01/13					Page 29
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH				Pages 34

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				<div>نقل الكهرباء</div> <div></div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title	BUS-D METERING EARTHING SPARE CONTACTS	ABB Job No.	N106931.004	= AG141D	
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00	Original	Tariq	01/13								Page	30
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SPARE TERMINALS

- X2 ⌀_A^B33 ⌀_A^B34 ⌀_A^B35
- X3 ⌀_A^B12 ⌀_A^B13
- X4 ⌀_A^B21 ⌀_A^B22
- X5 ⌀_A^B21 ⌀_A^B22 ⌀_A^B23
- X7 ⌀_A^B88 ⌀_A^B89 ⌀_A^B90 ⌀_A^B91 ⌀_A^B92 ⌀_A^B93 ⌀_A^B94
- X8 ⌀_A^B34 ⌀_A^B35 ⌀_A^B36 ⌀_A^B37
- X86 ⌀_A^B57 ⌀_A^B58 ⌀_A^B59 ⌀_A^B60 ⌀_A^B61 ⌀_A^B62
- X87 ⌀_A^B11 ⌀_A^B12
- X11 ⌀_A^B9 ⌀_A^B10

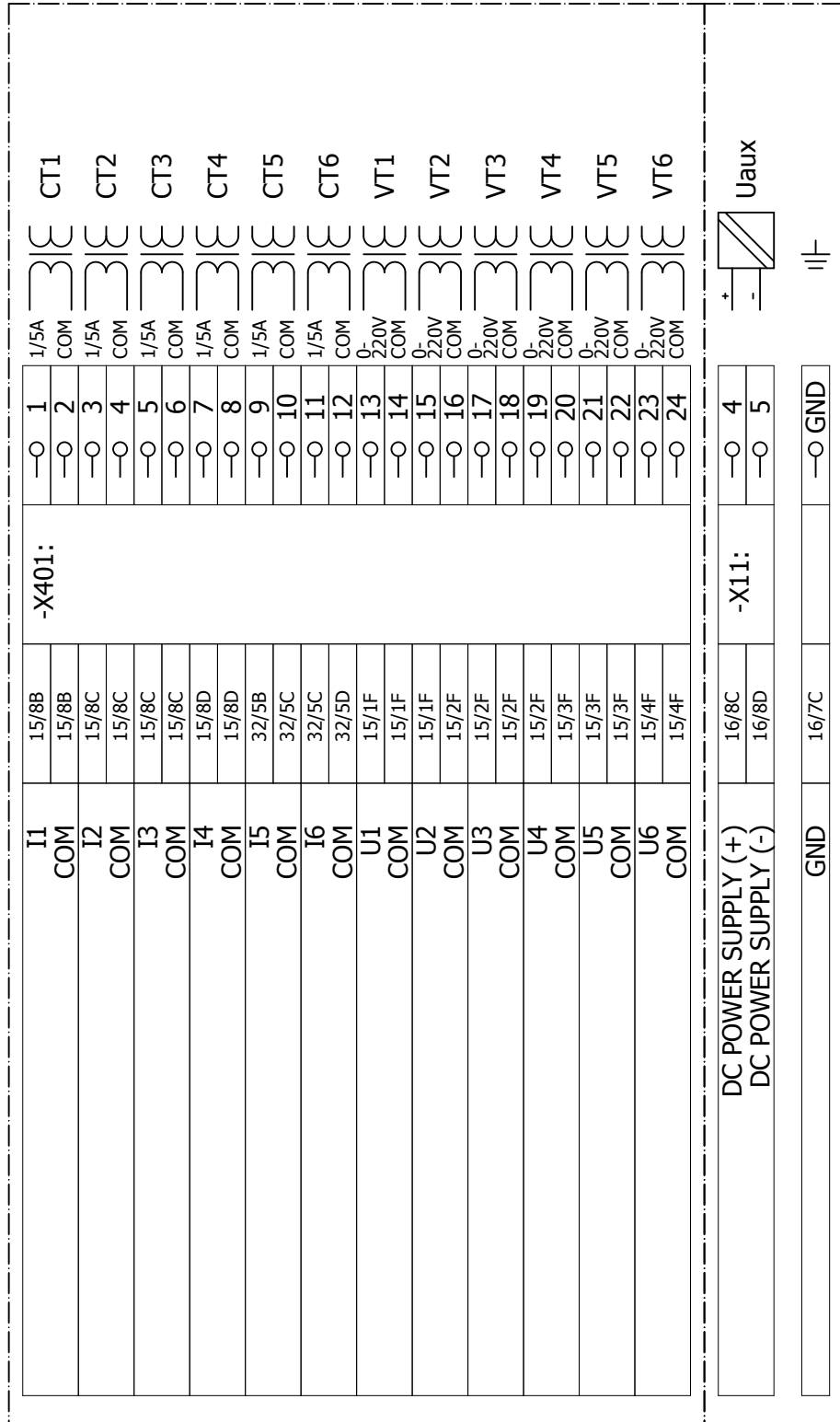
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Rev.	Description	By	Wk/Yr						Pages 34	

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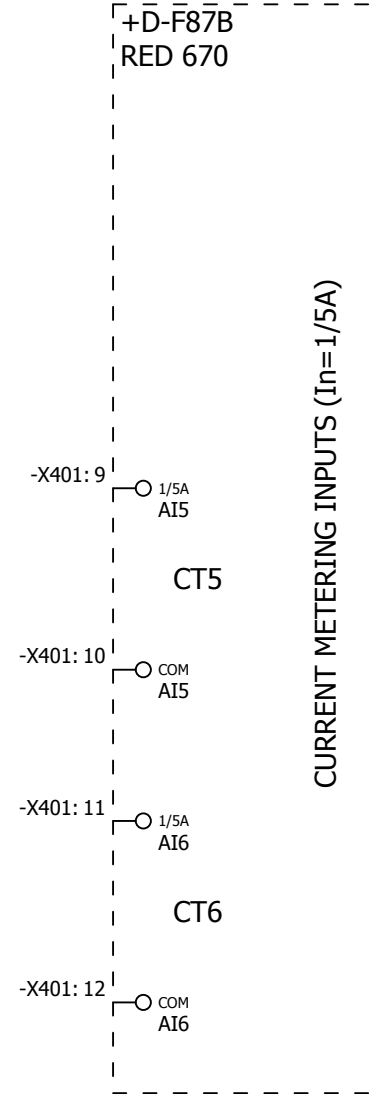
REC 670 : 87B PROTECTION RELAY

REC 670



REC 670
REC 670

REC 670 : ANALOG INPUTS
6CT (In = 1/5A)



REC 670

+D-F87B

REC 670 : 87B PROTECTION RELAY

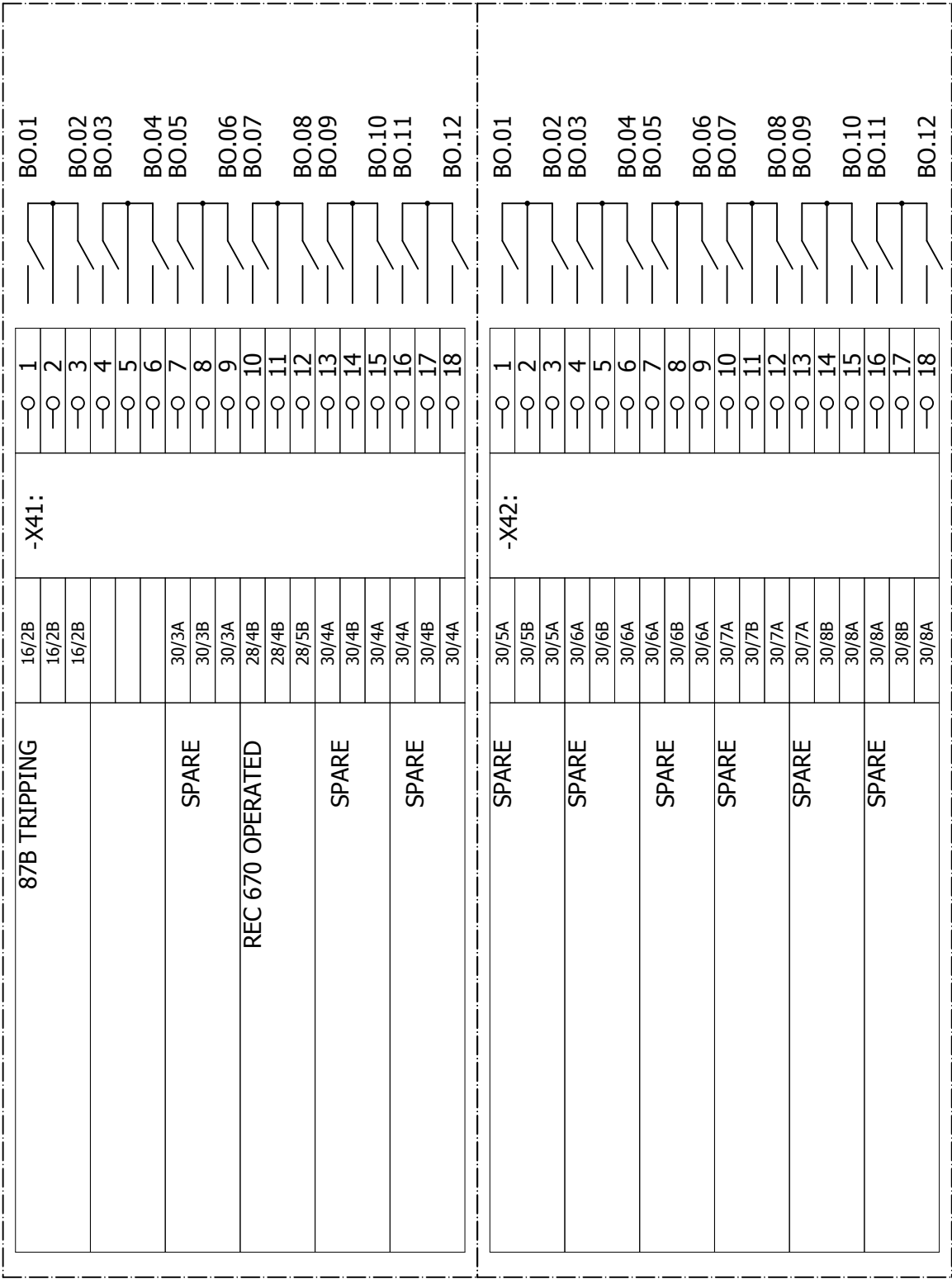
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18/5D SPARE		18/5E 6		18/6E 6	BI.05
18/6D SPARE		18/6E 7		18/7E 7	BI.06
18/7D SPARE		18/7E 8		18/8E 8	BI.07
18/8D SPARE		18/8E 9		18/9E 9	BI.08
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18/10D SPARE		18/10E 11		18/11E 11	
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18/12D SPARE		18/12E 13		18/13E 13	
18/13D SPARE		18/13E 14		18/14E 14	
18/14D SPARE		18/14E 15		18/15E 15	
18/15D SPARE		18/15E 16		18/16E 16	
BUS-D EATH SWITCH ON					
19/2D SPARE		19/2E 1	-X32:	19/3E 2	BI.09
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19/4D SPARE		19/4E 4		19/5E 4	BI.11
19/5D SPARE		19/5E 5		19/6E 5	BI.12
19/6D SPARE		19/6E 6		19/7E 6	BI.13
19/7D SPARE		19/7E 7		19/8E 7	BI.14
19/8D SPARE		19/8E 8		19/9E 8	BI.15
19/9D SPARE		19/9E 9		19/10E 9	BI.16
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19/13D SPARE		19/13E 13		19/14E 13	
19/14D SPARE		19/14E 14		19/15E 14	
19/15D SPARE		19/15E 15		19/16E 15	
19/16D SPARE		19/16E 16		19/17E 16	
20/2D SPARE		20/2E 1		-X51:	20/3E 2
20/3D SPARE		20/3E 3	20/4E 3		BI.02
20/4D SPARE		20/4E 4	20/5E 4		BI.03
20/5D SPARE		20/5E 5	20/6E 5		BI.04
20/6D SPARE		20/6E 6	20/7E 6		BI.05
20/7D SPARE		20/7E 7	20/8E 7		BI.06
20/8D SPARE		20/8E 8	20/9E 8		BI.07
20/9D SPARE		20/9E 9	20/10E 9		BI.08
20/10D SPARE		20/10E 10	20/11E 10		
20/11D SPARE		20/11E 11	20/12E 11		
20/12D SPARE		20/12E 12	20/13E 12		
20/13D SPARE		20/13E 13	20/14E 13		
20/14D SPARE		20/14E 14	20/15E 14		
20/15D SPARE		20/15E 15	20/16E 15		
20/16D SPARE		20/16E 16	20/17E 16		
21/2D SPARE		21/2E 1	-X52:		21/3E 2
21/3D SPARE		21/3E 3		21/4E 3	BI.10
21/4D SPARE		21/4E 4		21/5E 4	BI.11
21/5D SPARE		21/5E 5		21/6E 5	BI.12
21/6D SPARE		21/6E 6		21/7E 6	BI.13
21/7D SPARE		21/7E 7		21/8E 7	BI.14
21/8D SPARE		21/8E 8		21/9E 8	BI.15
21/9D SPARE		21/9E 9		21/10E 9	BI.16
21/10D SPARE		21/10E 10		21/11E 10	
21/11D SPARE		21/11E 11		21/12E 11	
21/12D SPARE		21/12E 12		21/13E 12	
21/13D SPARE		21/13E 13		21/14E 13	
21/14D SPARE		21/14E 14		21/15E 14	
21/15D SPARE		21/15E 15		21/16E 15	
21/16D SPARE		21/16E 16		21/17E 16	
28/5B REC 670 FAULTY		28/5B 1		-X11:	28/5B 3
		28/5B 2	28/5B 2		
		28/5B 2	28/5B 2		
TX			-X301:	A	
RX				B	
TX				C	
RX				D	
TX			-X302:	5	
RX			-X303:	6	
TX			-X311:	7	
RX			-X311:	8	
TX			-X311:	9	
RX			-X311:	10	
TX			-X311:	11	
RX			-X311:	12	
TX			-X312:	13	
RX			-X312:	14	
TX			-X313:	15	
RX			-X313:	16	
LAN					

REC 670


+D-F87B

REC 670 : 87B PROTECTION RELAY

REC 670



REC 670
REC 670

				<div>نقل الكهرباء</div> <div></div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title BUS-D METERING EARTHING REC670 - BINARY OUTPUT MODULE (BOM)	ABB Job No. N106931.004	= AG141D
					Checked Tariq	Approved S.Moin			+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2	CENTRAL REGION BRANCH	<div>ABB</div> ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. -	Lang. EN
0	Original	Tariq	24/12					Design No. 1YAB177002-SEX	Page 34
Rev.	Description	By	Wk/Yr				Pages 34		

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CA-289324

P

C424

11131061/00

JOB ORDER / CONTRACT NO.

INDEX

PLANT NO.

DRAWING NUMBER

REV. NO.

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0405
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 2000A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE	DRAWING NO.
XXXXX	XXXXX
XXXXX	XXXXX

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.


AS-BUILT

BY

DATE

01	14/13	Tariq	As per comments	Tariq	S.Moin
00	01/13	Tariq	Original	Tariq	S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.

الشركة الوطنية لنقل الكهرباء



National Grid

CENTRAL REGION BRANCH

DRAWN BY Tariq

CHECKED BY Tariq

SCALE

DATE STARTED 30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

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CERTIFIED

BY

DATE

COVER SHEET

BUS RISER

132/33kV # S/S-8501

SAUDI ARABIA

ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289324	1 of 12	00

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

DRAWING NUMBER	SHEET NO.	REV. NO.
CA-289324	1 of 12	00

S:\SWG Projects DRGS\SEC-COA\N106931-04 SS-8170-8178-8833-8501\Detail Design\8501

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This typical is also valid for: AG730C

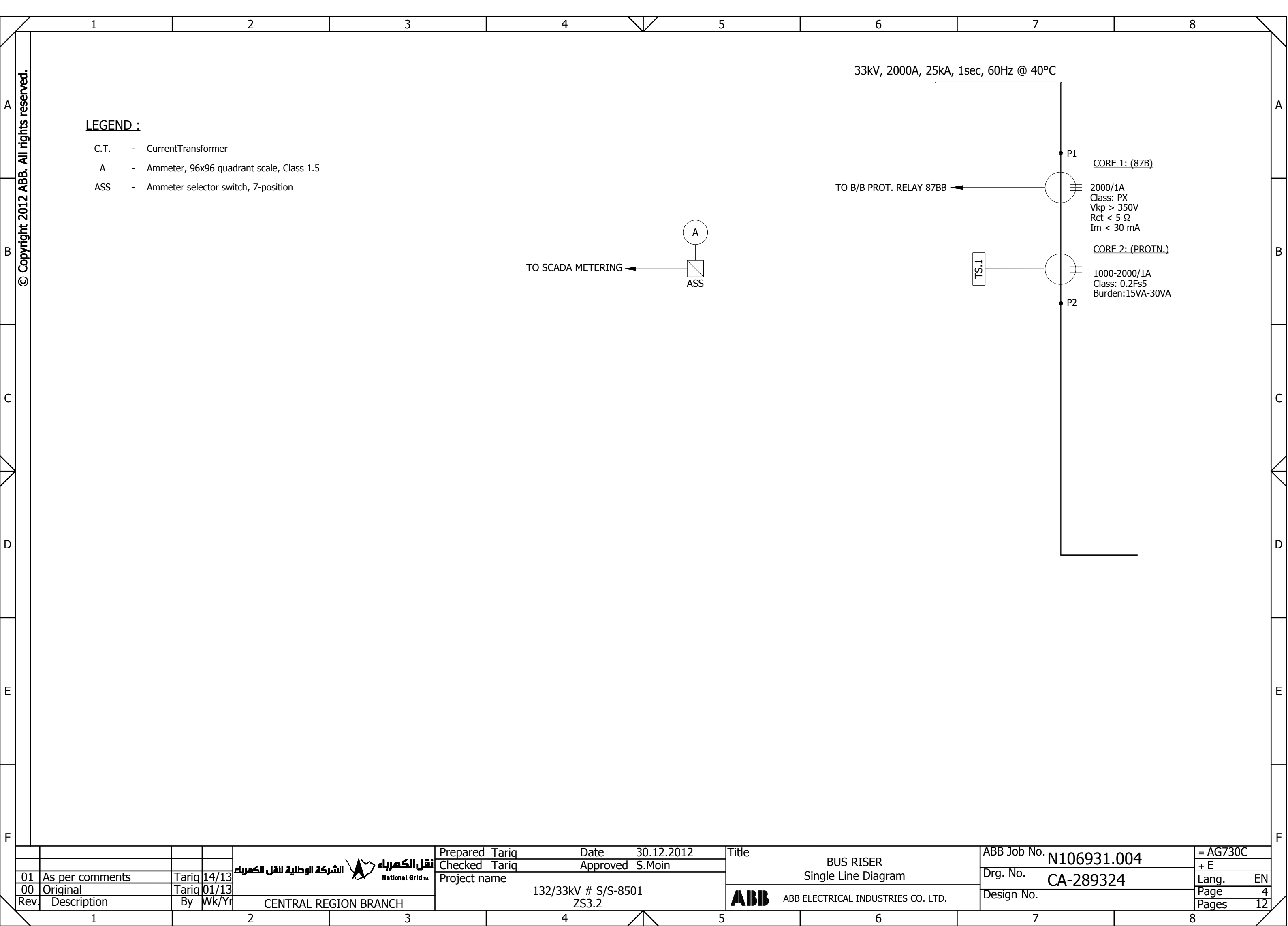
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Pages	Page name	Rev	Description	Rev	Description	Rev	Description	Rev	Description
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=AG730C+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG730C+E/3	Terminal Block Schedule	00	Original	01	As per comments				
=AG730C+E/4	Single Line Diagram	00	Original	01	As per comments				
=AG730C+E/5	Cubicle Assembly	00	Original	01	As per comments				
=AG730C+E/6	Apparatus List	00	Original	01	As per comments				
=AG730C+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG730C+E/8	87B PROTECTION CORE1	00	Original	01	As per comments				
=AG730C+E/9	METERING CORE 2	00	Original	01	As per comments				
=AG730C+E/10	AC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG730C+E/11	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG730C+E/12	SPARE TERMINALS	00	Original	01	As per comments				

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1		2		3		4		5		6		7		8	
TERMINALS															
NAME	TYPE		REMARK			QUANTITY		FUNCTION							
X3	USST4					13		CONTROL CIRCUIT							
X7	WTR-4SL					6		SCADA CIRCUIT							
X11	OTTA6-T-P/P					13		CT CIRCUIT							
X12	OTTA6-T-P/P					22		CT CIRCUIT							
X87	OTTA6-T-P/P					8		CT CIRCUIT							

				Prepared Tariq		Date 30.12.2012		Title		ABB Job No. N106931.004		= AG730C		
				Checked Tariq		Approved S.Moin		BUS RISER Terminal Block Schedule		Drg. No. CA-289324		+ E		
01	As per comments		Tariq	14/13	Project name 132/33kV # S/S-8501		Lang. EN							
00	Original		Tariq	01/13			Page 3							
Rev.	Description		By	Wk/Yr	CENTRAL REGION BRANCH		ZS3.2		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.		Design No.		Pages 12	



1		2		3		4		5		6		7		8	
A															
B															
C															
D															
E															
F															
				<div>Prepared Tariq</div> <div>Date 30.12.2012</div>			<div>Title</div> <div>BUS RISER</div> <div>Cubicle Assembly</div>			<div>ABB Job No.</div> <div>N106931.004</div>			<div>= AG730C</div>		
				<div>Checked Tariq</div> <div>Approved S.Moin</div>			<div>ABB</div> <div>ABB ELECTRICAL INDUSTRIES CO. LTD.</div>			<div>Drg. No.</div> <div>CA-289324</div>			<div>+ E</div>		
01	As per comments	Tariq	14/13	<div>Project name</div> <div>132/33kV # S/S-8501</div> <div>ZS3.2</div>						<div>Lang.</div> <div>EN</div>			<div>Page</div> <div>5</div>		
00	Original	Tariq	01/13							<div>Design No.</div>			<div>Pages</div> <div>12</div>		
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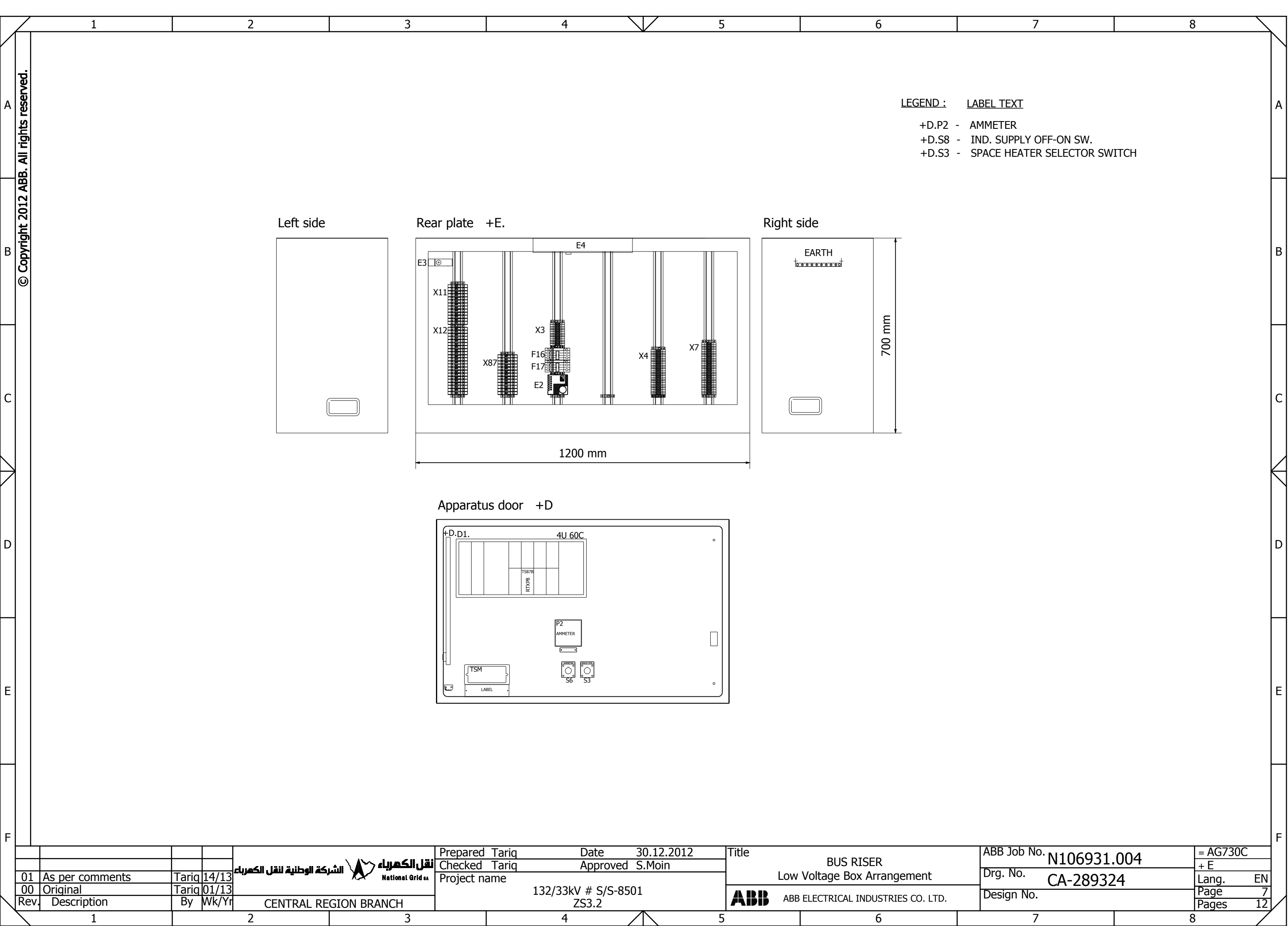
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الشركة الوطنية لنقل الكهرباء




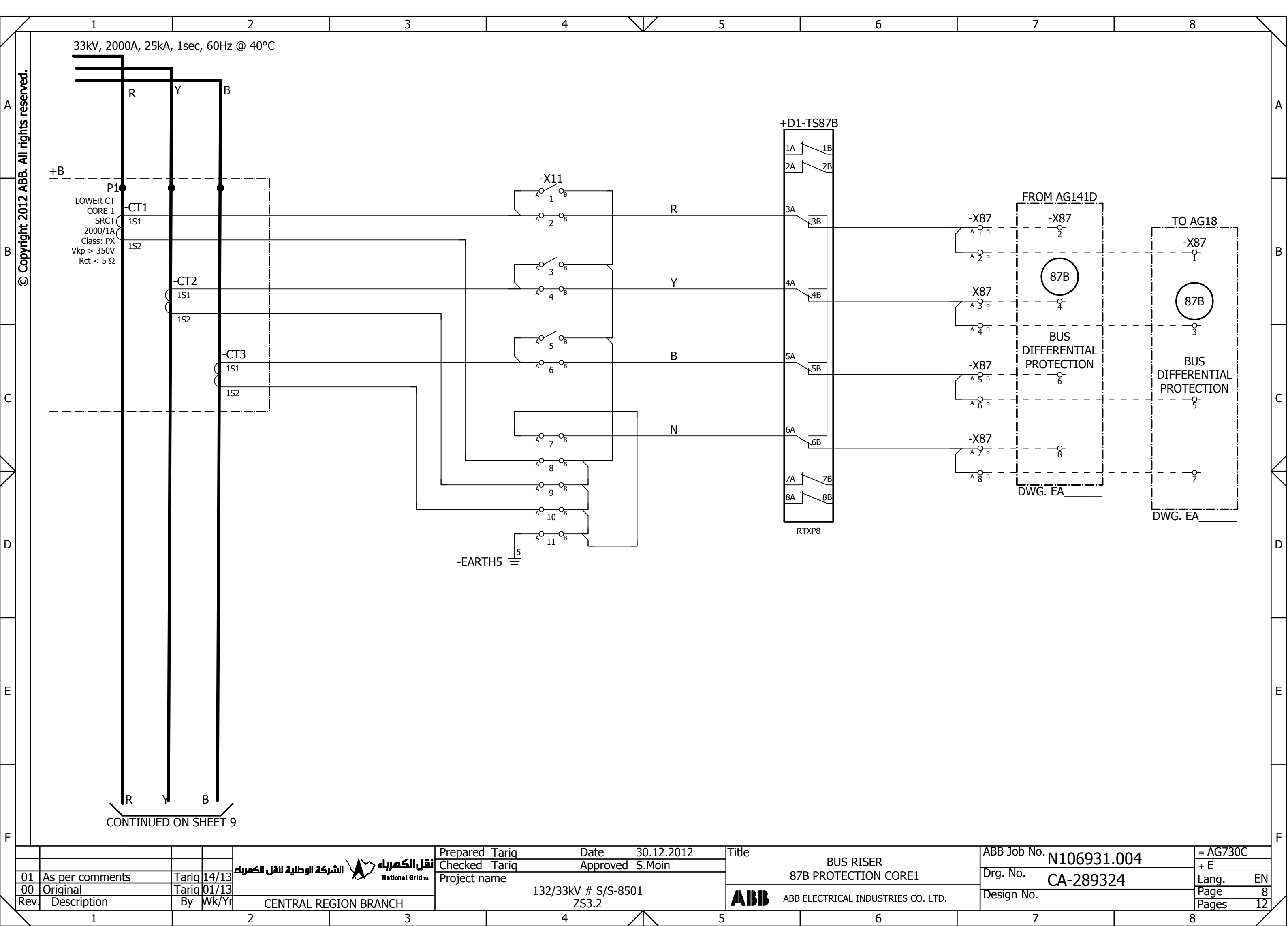
National Grid SA


1		2		3		4		5		6		7		8	
Item Number		Component number		Object description						Comp. Qty (CUn)					
+B-CT1-3		CT-N106931-33KBR		ABB EJP : TPU76.63 DWG NO - 44615600 (P2 TOWARD SECONDARY TERMINAL BOX) BIL:36/70/170kV, Frequency : 60Hz. Ambient temp: 40C Ith : 25kA (1 sec) I DYNAMIC/Peak :65kA (2.6 times the Ith as per IEC for 60hz). Thermal over current factor: 1.2 for single ratio Primary terminal silver plated. CORE 1- 87B RATIO : 2000/1A CLASS : PX Vkp : 350V Io : 30mA Rct : 5 Ohms CORE 1- Metering RATIO : 1000-2000/1A CLASS : 0.2Fs5 BURDEN : 15VA-30VA						3					
+C-EC		AE5858-2004-AB								1					
+D-P2		MV-A96LI-1A-2000-D		AMMETER, Type : A96LI-CT-A, 2000-1000/1A						1					
+D1-TS87B		MV RK 926 002-AD		RTXP8						1					
+D-D1		MV-RK 927 004-AB		COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C						1					
+D-TSM		MV-129A514G01		FT-1 SW-FOR METERING CT/VT ISOL.(6C+4P)						1					
+D-S3		CA10-A260-FUAP534		Space heater SW "Off-Auto-Manual" (K&N)						1					
+D-S6		CHR10-A038-AMTR		Ammeter Selector Switch (K&N)						1					
+E-E2		DMS 3110		THERMOSTAT 24,48,60,115 & 230V						1					
+E-E41		MV 5911 0818-01		FLUORESCENT LAMP WITH DIFFUSER, 120VAC						1					
+E-EC		GCE0990162P0101		PANEL HEATER 240V,50W-Boxin-3Met.Cable						1					
+E-F16-17		MV-S 202-K6		MCB 2 POLE 6A -AC						2					
		DMS 924 0002		COMBIFLEX TERMINAL BASE RX4 (4U 12C)						3					
		DMS 924 0004		COMBIFLEX TERMINAL BASE RX 2H (4U 6C)						3					
		MV-S2C-H11L		.Ux contact 1NO+1NC AC -MCB						2					



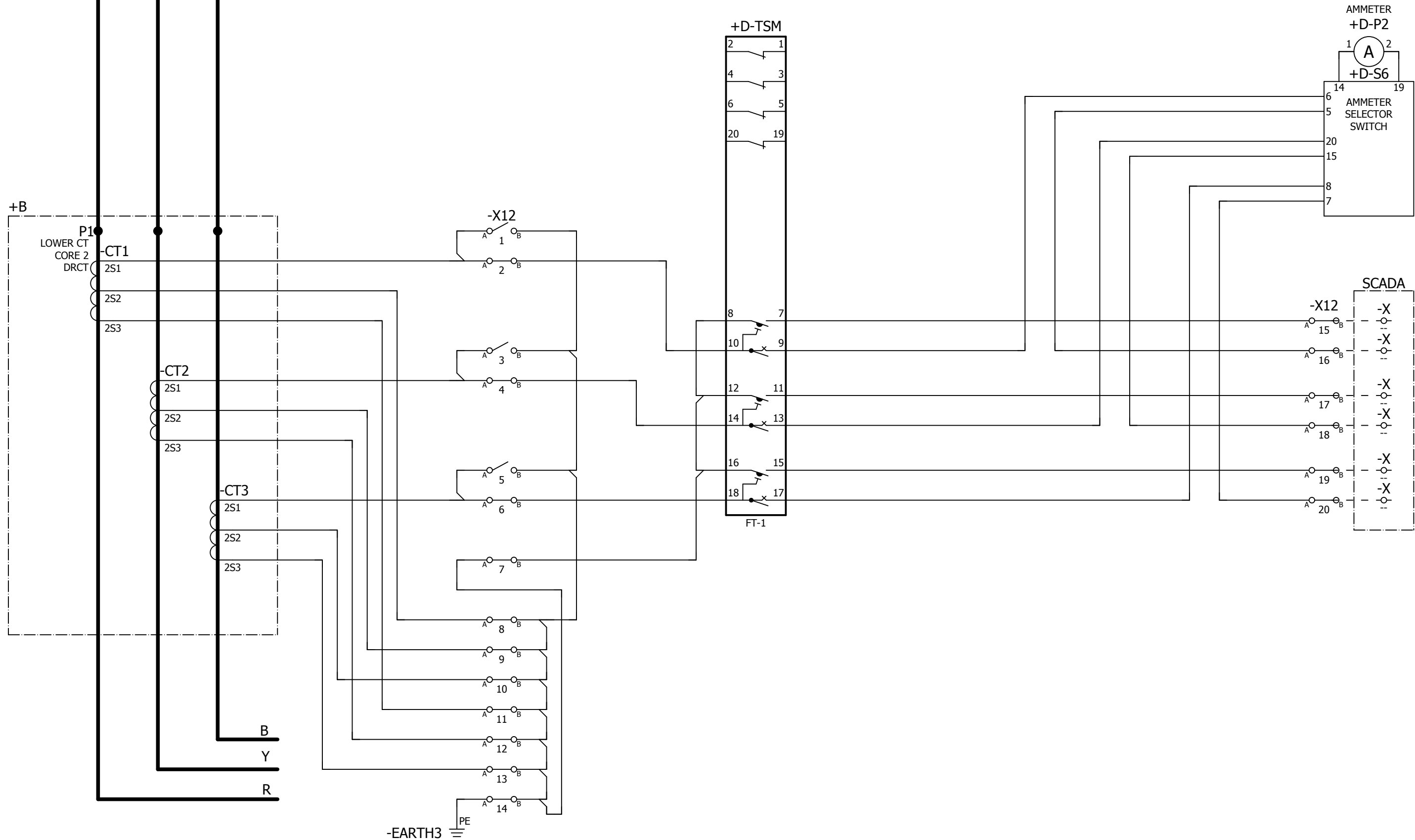
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					Checked Tariq	Approved S.Moin			Drg. No.	CA-289324	+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Lang.	EN	
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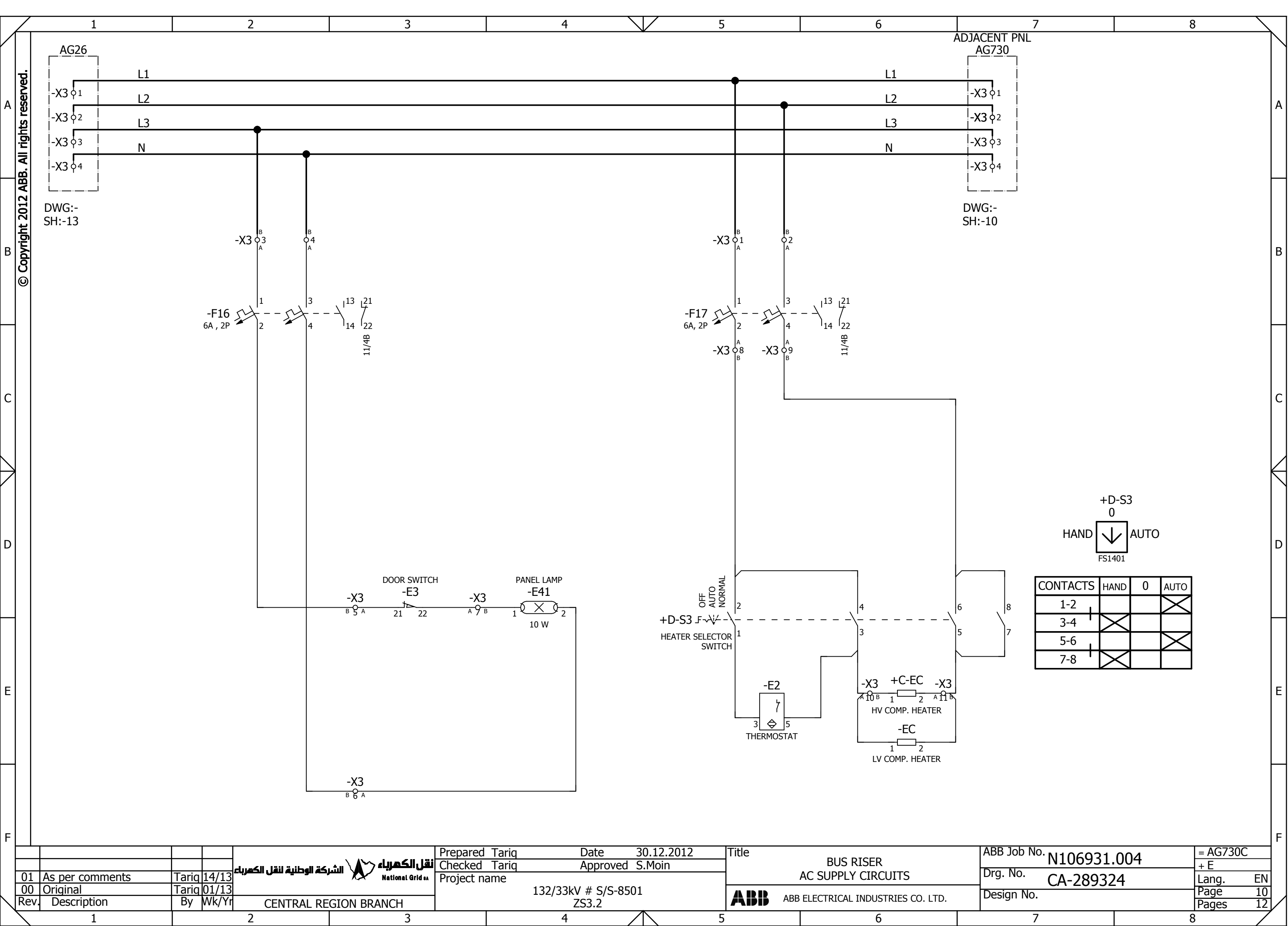


				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title BUS RISER 87B PROTECTION CORE1	ABB Job No.	N106931.004	= AG730C	
					Checked Tariq	Approved S.Moin				+ E	
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Drg. No.	CA-289324	Lang. EN	
00	Original	Tariq	01/13								
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				Prepared Tariq	Date 30.12.2012	Title	ABB Job No. N106931.004	= AG730C
				Checked Tariq	Approved S.Moin		Drg. No. CA-289324	+ E
01	As per comments	Tariq	14/13	Project name 132/33kV # S/S-8501 ZS3.2		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Lang. EN
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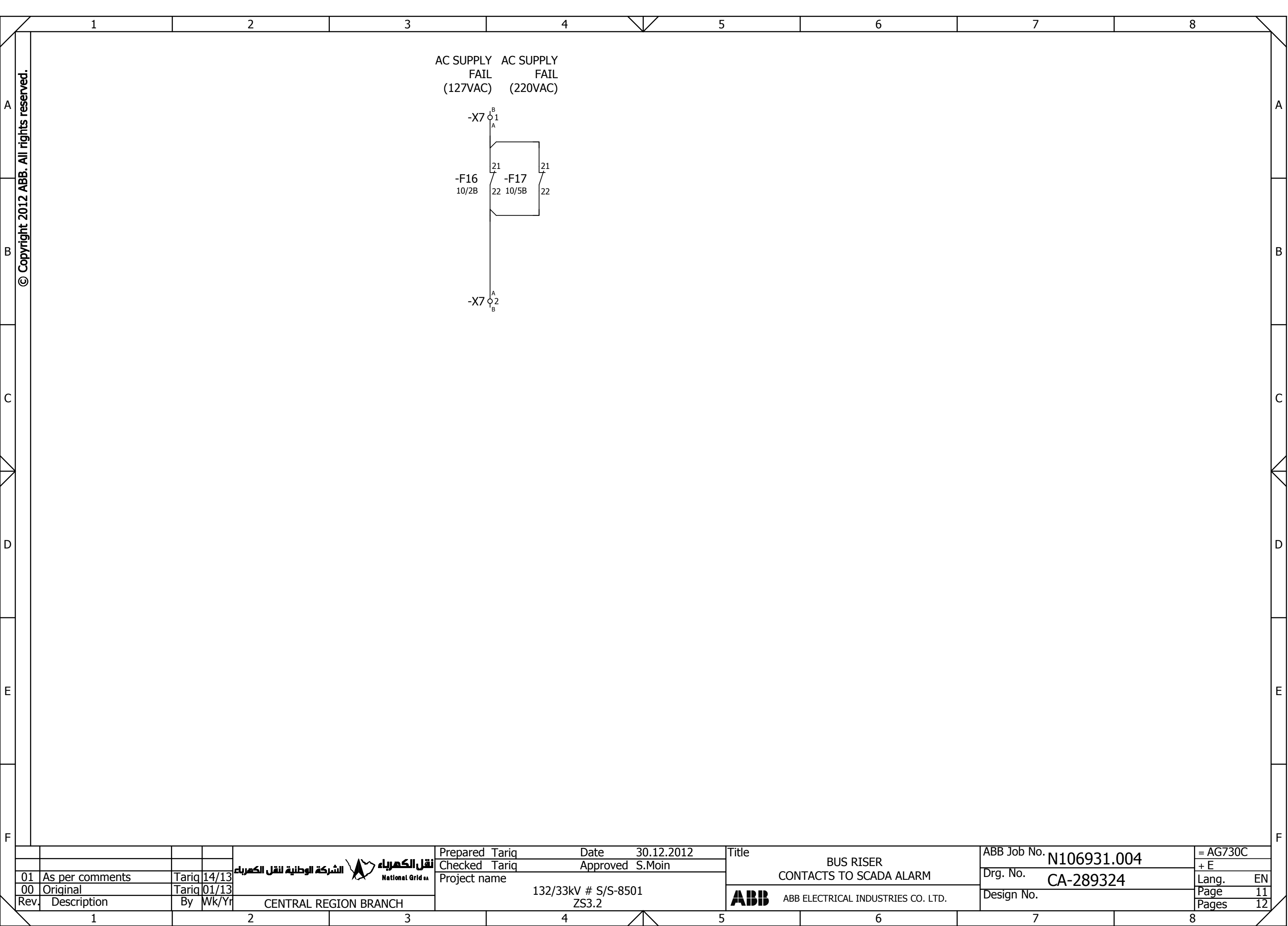


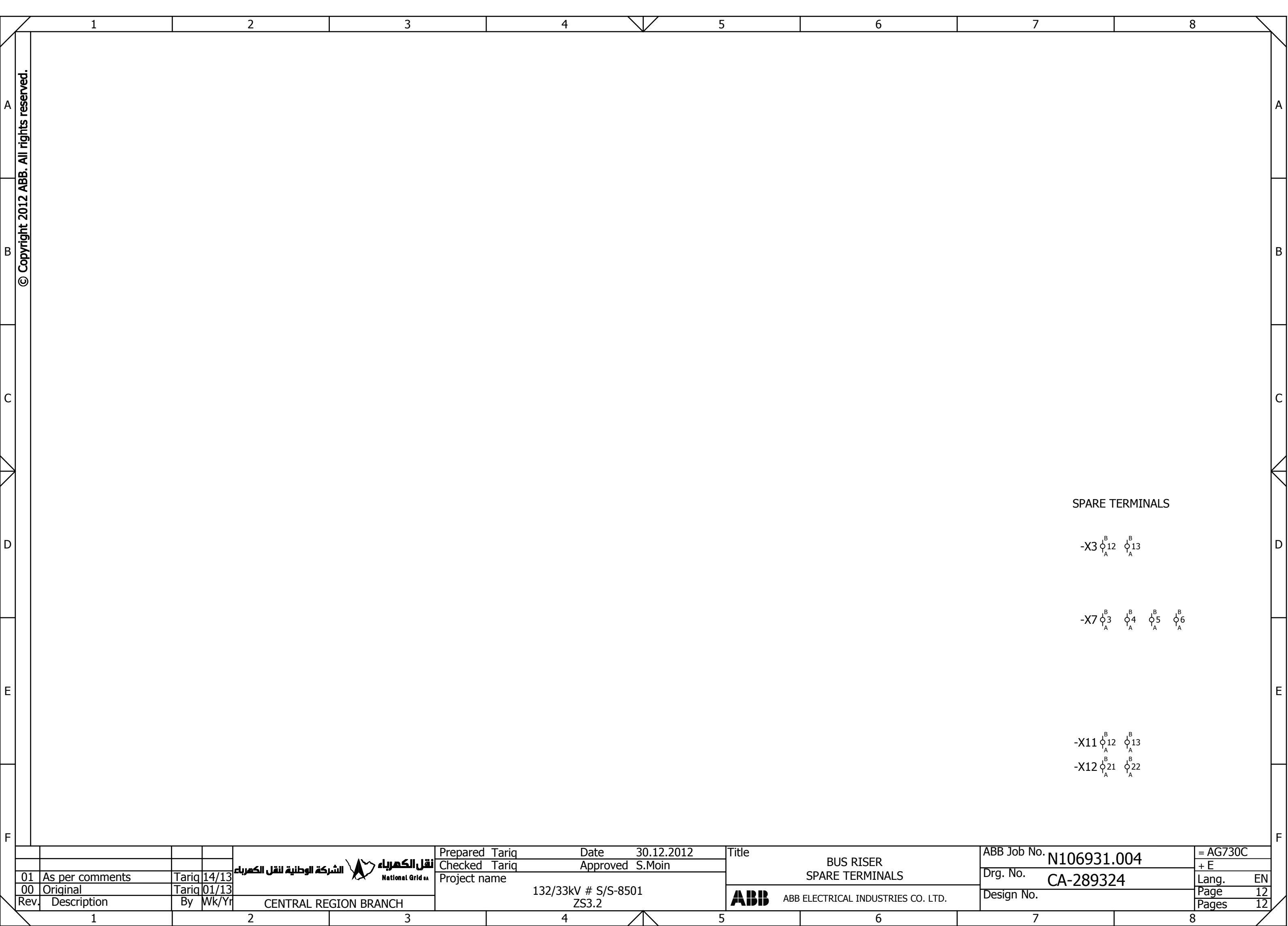
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Rev.	Description	By	Wk/Yr	
1		2	3	CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name 132/33kV # S/S-8501 ZS3.2	


Title	
BUS RISER AC SUPPLY CIRCUITS	
ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	

ABB Job No.	N106931.004	= AG730C
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				 الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date 30.12.2012	Title BUS RISER SPARE TERMINALS	ABB Job No.	N106931.004	= AG730C	
					Checked Tariq	Approved S.Moin			Drg. No.	CA-289324	+ E
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2	ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.			Lang. EN
00	Original	Tariq	01/13								
Rev.	Description	By	Wk/Yr							Page 12	
										Pages 12	

SPARE TERMINALS

-X3 ϕ_{12}^B ϕ_{13}^B

-X7 ϕ_3^B ϕ_4^B ϕ_5^B ϕ_6^B

-X11 ϕ_{12}^B ϕ_{13}^B

-X12 ϕ_{21}^B ϕ_{22}^B

1			2		
00	1 of 28	CA-280325	P	C424	11131061/00
REV. NO.		DRAWING NUMBER	PLANT NO.	INDEX	JOB ORDER / CONTRACT NO.

Rating Plate




ABB Electrical Industries Co. Ltd. Saudi Arabia


Type	: ZS3.2
Serial No.	: 1YAN106931B0406
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 2000A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS


DRAWING TITLE		DRAWING NO.
XXXXX		XXXXX
XXXXX		XXXXX


 ABB ELECTRICAL INDUSTRIES CO. LTD.

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BY _____ DATE _____

01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

 **نقل الكهرباء**
National Grid

 **الشركة الوطنية لنقل الكهرباء**

CENTRAL REGION BRANCH

DRAWN BY Tariq CHECKED BY Tariq SCALE _____
DATE STARTED 30.12.2012 DATE COMPLETED _____
OPRG. DEPT. _____ ENG. DEPT. _____

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CERTIFIED _____
BY _____ DATE _____


COVER SHEET

BUS SECTIONALIZER

132/33kV # S/S-8501

SAUDI ARABIA

ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-280325	1 of 28	00

 ABB ELECTRICAL INDUSTRIES CO. LTD.

DRAWING NUMBER	SHEET NO.	REV. NO.
CA-280325	1 of 28	00



ABB CUBICLE NO.	SEC CUBICLE NO.	EARTH SWITCH NO.
= AG730		

ABB JOB NO.	JOB ORDER / CONTRACT NO.
N106931.004	11131061/00

This typical is also valid for: AG730

SHEET INDEX

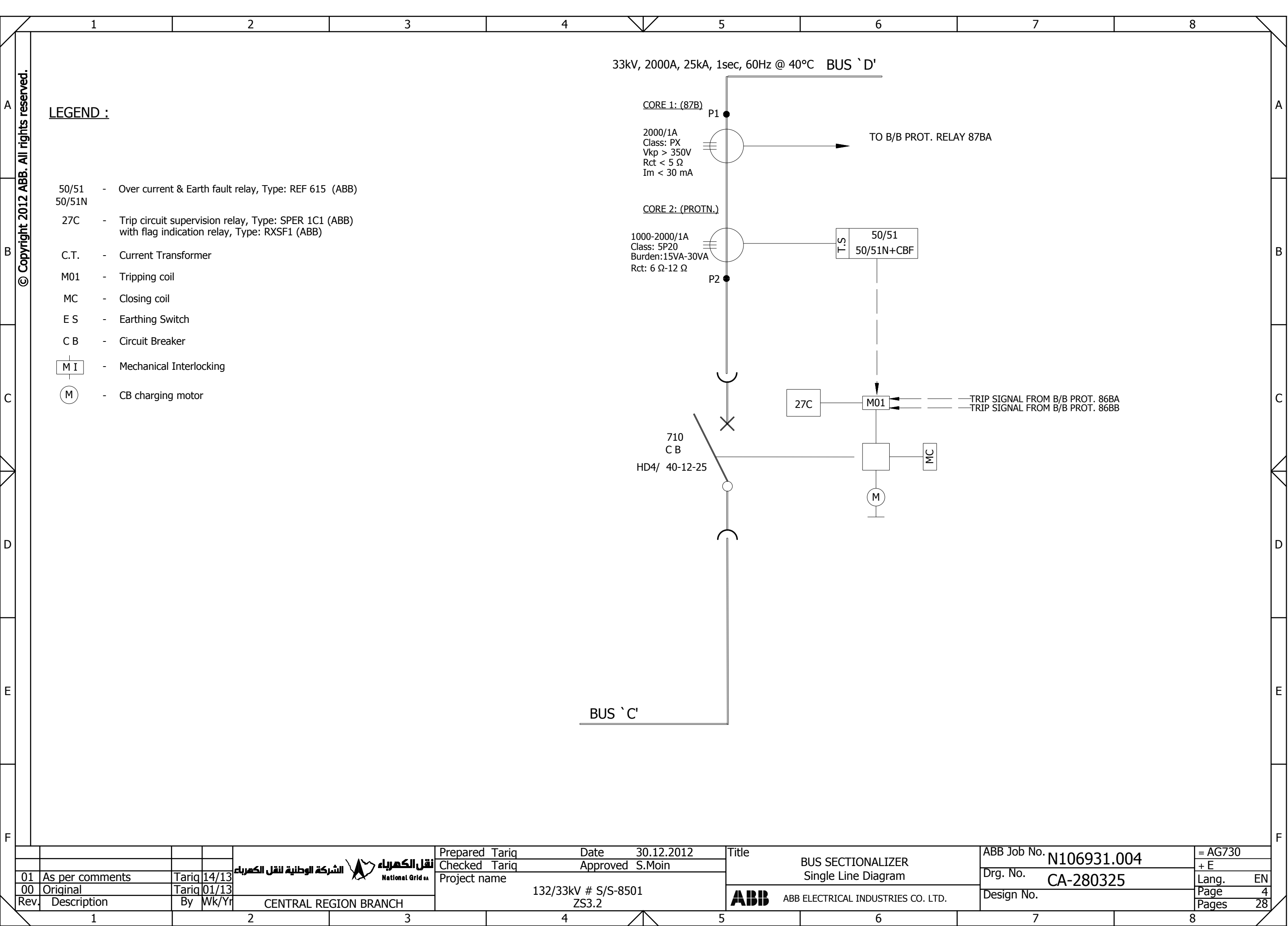
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=AG730+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG730+E/3	Terminal Block Schedule	00	Original	01	As per comments				
=AG730+E/4	Single Line Diagram	00	Original	01	As per comments				
=AG730+E/5	Cubicle Assembly	00	Original	01	As per comments				
=AG730+E/6	Apparatus List	00	Original	01	As per comments				
=AG730+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG730+E/8	CT CORE1-87B PROTECTION	00	Original	01	As per comments				
=AG730+E/9	CT CORE2-O/C+E/F PROTECTION	00	Original	01	As per comments				
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=AG730+E/16	CB CONTACTS MULTIPLICATION	00	Original	01	As per comments				
=AG730+E/17	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG730+E/18	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG730+E/19	CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	00	Original	01	As per comments				
=AG730+E/20	INDICATION CIRCUIT	00	Original	01	As per comments				
=AG730+E/21	CONTACTS TO SCADA INDICATION	00	Original	01	As per comments				
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=AG730+E/23	SPARE CONTACTS	00	Original	01	As per comments				
=AG730+E/24	SPARE CONTACTS (REF 615)	00	Original	01	As per comments				
=AG730+E/25	REF615 - A/I + Binary I/O Board	00	Original	01	As per comments				
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=AG730+E/27	HD4 SPARE CONTACTS	00	Original	01	As per comments				
=AG730+E/28	HD4 INTERNAL WIRING	00	Original	01	As per comments				

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0	Original	Tariq	01/13			132/33kV # S/S-8501						Page	2
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ZS3.2						Pages	28

1		2		3		4		5		6		7		8	
TERMINALS															
NAME	TYPE		REMARK			QUANTITY		FUNCTION							
X3	USST4					13		CONTROL CIRCUIT							
X4	USST4					25		CONTROL CIRCUIT							
X5	USST4					72		CONTROL CIRCUIT							
X5.1	USST4					77		CONTROL CIRCUIT							
X7	WTR-4SL					65		SCADA CIRCUIT							
X11	OTTA6-T-P/P					13		CT CIRCUIT							
X12	OTTA6-T-P/P					16		CT CIRCUIT							
X52	USST4					55		CB CIRCUIT							
X87	OTTA6-T-P/P					10		CT CIRCUIT							
X2	WTL6SL					10		VT CIRCUIT							

				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>		Prepared Tariq		Date 30.12.2012		Title		ABB Job No.		= AG730		
						Checked Tariq		Approved S.Moin				Drg. No.		+ E		
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00	Original		Tariq	01/13									Design No.		Page 3	
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				Prepared Tariq	Date 30.12.2012	Title	ABB Job No. N106931.004	= AG730
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00	Original	Tariq	01/13					Page 4
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1		2		3		4		5		6		7		8	
A	Item Number		Component number		Object description		Comp. Qty (CUn)								
	+A-Q0		HD4-402025-125V		SF6 CB:HD4/Z40.20.25(FOR ZS3.2-125VDC		1								
B	+B-CT1-3		CT-N106931-33KVBS		ABB EJJ : TPU76.63 BIL:36/70/170kV, Frequency : 60Hz. Ambient temp: 40C Ith : 25kA (1 sec) IDYNAMIC/Peak :65kA Thermal over current factor: 1.2 for single ratio CORE 1- 87B RATIO : 2000/1A CLASS : PX Vkp : 350V Io : 30mA Rct : 5 Ohms CORE 2- 50/51 RATIO : 1000-2000/1A CLASS : 5P20 Burden : 15VA-30VA Rct : 6 Ohms - 12 Ohms		3								
	+C-EC		AE5858-2004-AB		SPACE HEATER 220V AC, 150-200W		1								
C	+D-D1		MV-RK 927 004-AB		COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C		1								
	+D1-741-4		MV RS 702 290-AA		SPER1C1/E255:RS 702 290-AA -w/o LED-TCS		4								
D	+D1-74DC		MV RK 271 019-AN		RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-		1								
	+D1-74RDC		MV RK 271 019-AN		RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-		1								
E	+D1-74TC		MV RK 271 019-AN		RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-		1								
	+D1-F52X		MV RK 251 401-AP		BISTABLE RELAY, RXIMVB 4 : RK 251 401-AP		1								
F	+D1-S8X		MV RK 000 863-AN		AUXILIARY RELAY: RXMB1 6NO-110-125VDC		1								
	+D1-S9X		MV RK 000 863-AN		AUXILIARY RELAY: RXMB1 6NO-110-125VDC		1								
	+D1-TS1		MV RK 926 115-BF		RELAY TEST SWITCH: RTXP18:RK 926 115-B		1								
	+D1-TS87B		MV RK 926 002-AD		RTXP8		1								
	+D-F1		HBFJAEAGNEA1BAA1XE		REF615 -4I+5U-16BI+10BO+IEC61850		1								
	+D-F86CBF		MV-MVAJ105RA0802		Lockout Relay for CBF stage-2(8 NO + 2 NC)		1								
	+D-F94		MV-MVAJ101-RA-0802		MVAJ101 , (8 NO + 2 NC)		1								
	+D-H1		LED-125V-RESDIOD-R		LED48 -125VDC, Resist+Diode22 DIA, RED		1								
	+D-H2		LED-125V-RESDIOD-G		LED48 -125VDC, Resist+Diode22DIA, GREEN		1								
	+D-H3-4		LED-125V-RESDIOD-W		LED48-125VDC, Resist+Diode 22 DIA,WHITE		2								
	+D-S1		CA10-A216-FUAP530		CB OPEN-NORMAL-CLOSE-Padlock.red handle		1								
	+D-S2		CA10UAP538FUAP580P		OFF-MIMIC-BCU-SAS SW., PADLOCK (K&N)		1								
	+D-S3		CA10-A260-FUAP534		Space heater SW "Off-Auto-Manual" (K&N)		1								
	+D-S4		CA10-A204-FUAP535		Lamp Test Switch (K&N)		1								
	+D-S86		MV-1SFA616100R4076		PB Black 1NO+1NC-22 dia-1SFA611100R4076		1								
	+E-E2		DMS 3110		THERMOSTAT 24,48,60,115 & 230V		1								
	+E-E41		MV 5911 0818-01		FLUORESCENT LAMP WITH DIFFUSER, 120VAC		2								
	+E-EC		GCE0990162P0101		PANEL HEATER 240V,50W-Boxin-3Met.Cable		1								
	+E-F11-15		MV-S 282 UC-K6		MCB 6A DC -2P		5								
	+E-F16		MV-S 202-K16		MCB 16A AC -2P		1								
	+E-F17		MV-S 202-K10		MCB -2POLE-10A -AC		1								
	+E-X10		AE2000-5380-03		POWER OUTLET 125VAC 15A (GE) DUAL TYPE		1								
	+E-X20		AE2000-5380-01		POWER OUTLET 250VAC -10A (GE) DUAL TYPE		1								
			MV-S2-H11		Aux contact for DC MCB 1No+1NC		5								
			MV-RK 927 004-AB		COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C		1								
			DMS 924 0004		COMBIFLEX TERMINAL BASE RX 2H (4U 6C)		1								
			DMS 924 0002		COMBIFLEX TERMINAL BASE RX4 (4U 12C)		1								
			MV-S2C-H11L		.Ux contact 1NO+1NC AC -MCB		2								
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Rev.		Description		By Wk/Yr		Project name		ABB		Design No.		Lang.		EN	
				CENTRAL REGION BRANCH		132/33kV # S/S-8501 ZS3.2		ABB ELECTRICAL INDUSTRIES CO. LTD.				Page		6	
												Pages		28	

- +D.F1 - O/C + E/F & CBF PROTECTION RELAY
- +D.F94 - TRIPPING RELAY
- +D.F86CBF - CBF LOCKOUT RELAY
- +D.H1 - CB "ON"
- +D.H2 - CB "OFF"
- +D.H3 - CB "TEST" POSITION"
- +D.H4 - CB "SERVICE" POSITION"
- +D.S1 - Breaker control switch, OPEN-NORMAL-CLOSE
- +D.S2 - LOCAL/REMOTE SWITCH
- +D.S3 - SPACE HEATER SELECTOR SWITCH
- +D.S4 - LAMP TEST SWITCH
- +D.S86 - CBF L/O RESET

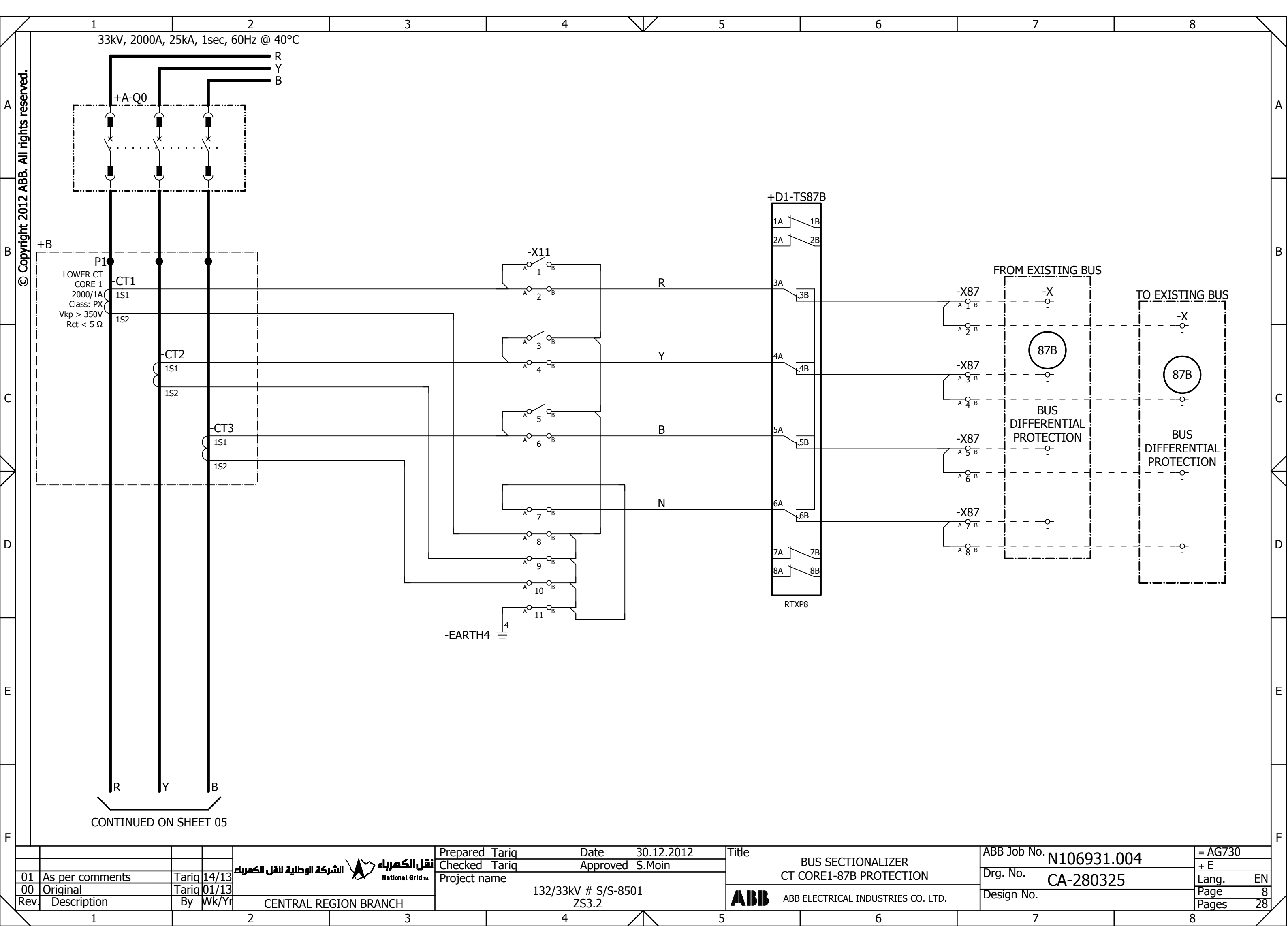


Diagram of a rectangular plate with a hole. The plate is labeled "EARTH" at the top. The hole is labeled "X10" and "X20". The plate is labeled "100 mm" on the right side.

The diagram shows the back panel of the 4U 60C chassis. Key components include:

- Top Left:** A large rectangular panel with multiple ports labeled TS2, TS8/7B, 741, 743, 74DC, 74RDC, F52X, and RXMVB4. Below these are labels for RXP18, SPER, RXSF1, and RXMB1.
- Top Right:** Two vertical modules labeled F94 and F86C.BF, each with a label MVA101 and MVA105.
- Bottom Left:** A large rectangular panel labeled F1 and REF 615.
- Bottom Center:** Four circular connectors labeled S4, S3, S2, and S1, each with a label above it: S4P/54P, S3P/53P, S2P/52P, and S1P/51P.
- Bottom Right:** Four circular connectors labeled H1, H2, H3, and H4, each with a label above it: H1, H2, H3, and H4.
- Bottom Far Right:** A circular connector labeled 586.

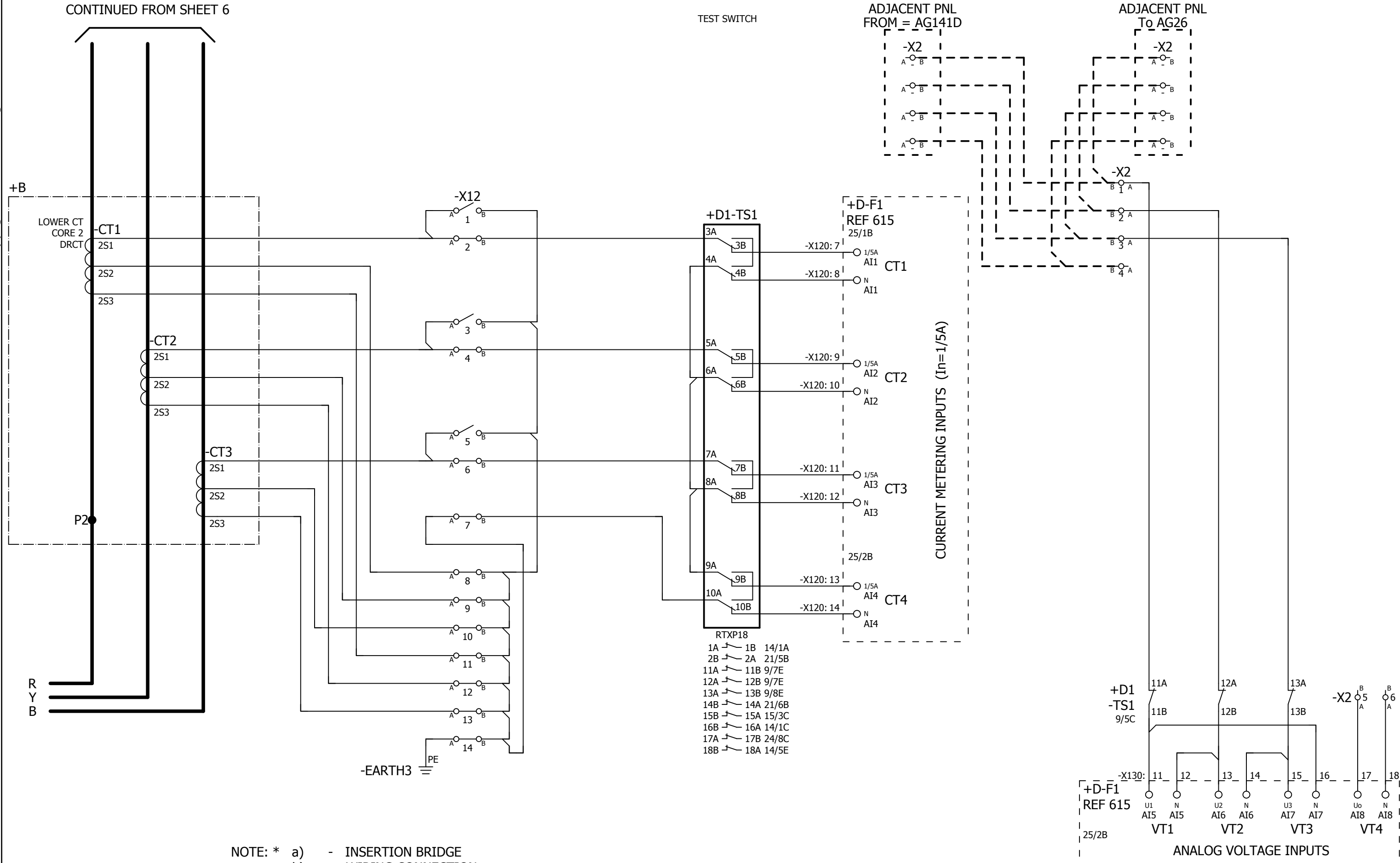
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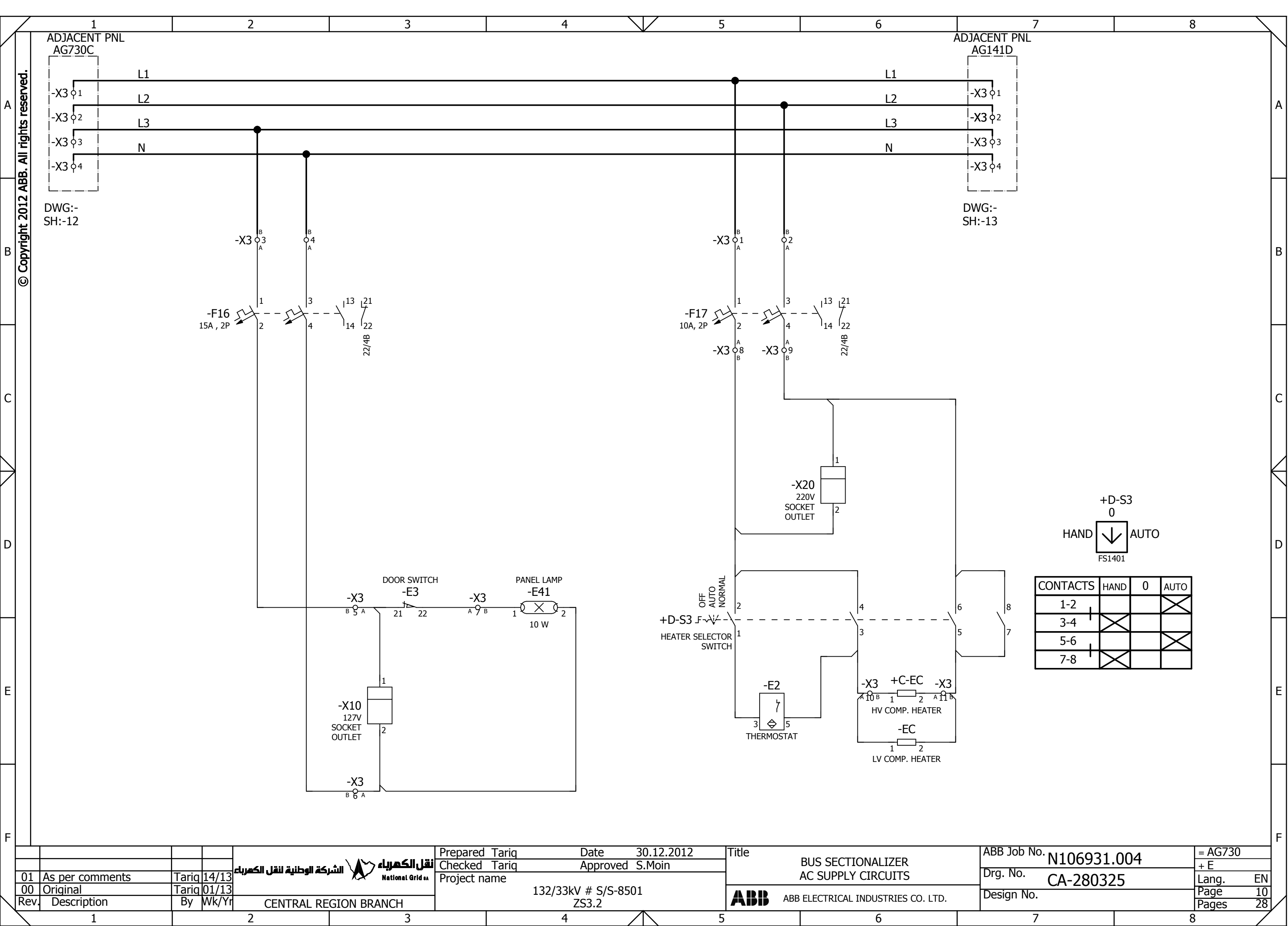
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00	Original	Tariq	01/13					Page 8
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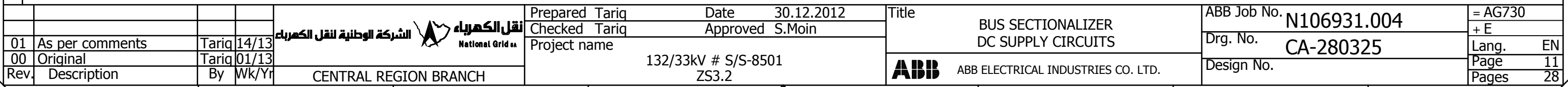
CONTINUED FROM SHEET 6



NOTE: * a) - INSERTION BRIDGE
b) - WIRING CONNECTION
○ - 'SLIDE' IN OPEN POSITION
● - 'SLIDE' IN CLOSE POSITION

				<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title BUS SECTIONALIZER CT CORE2-O/C+E/F PROTECTION	ABB Job No.	N106931.004	= AG730	
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B

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A

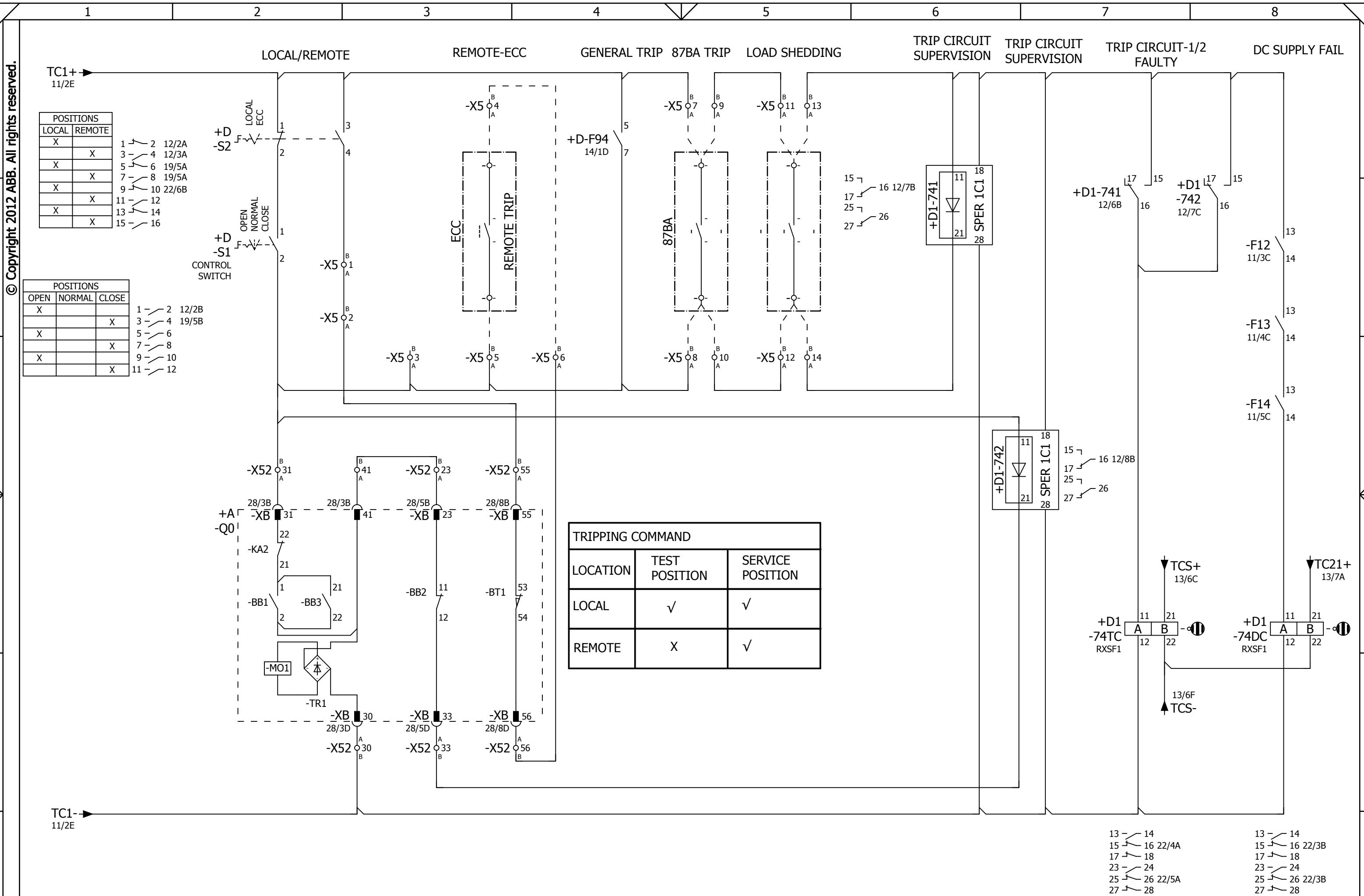
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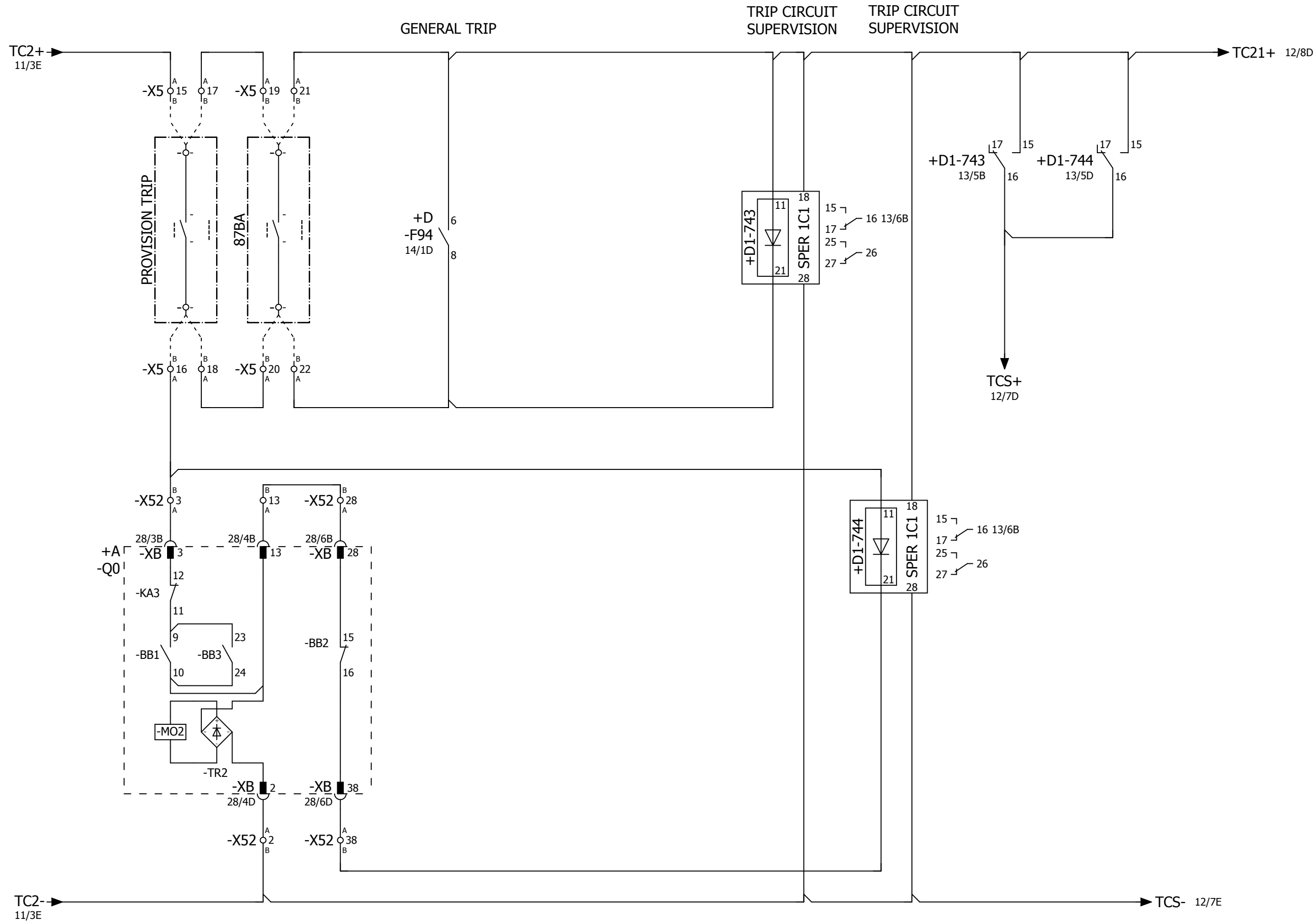
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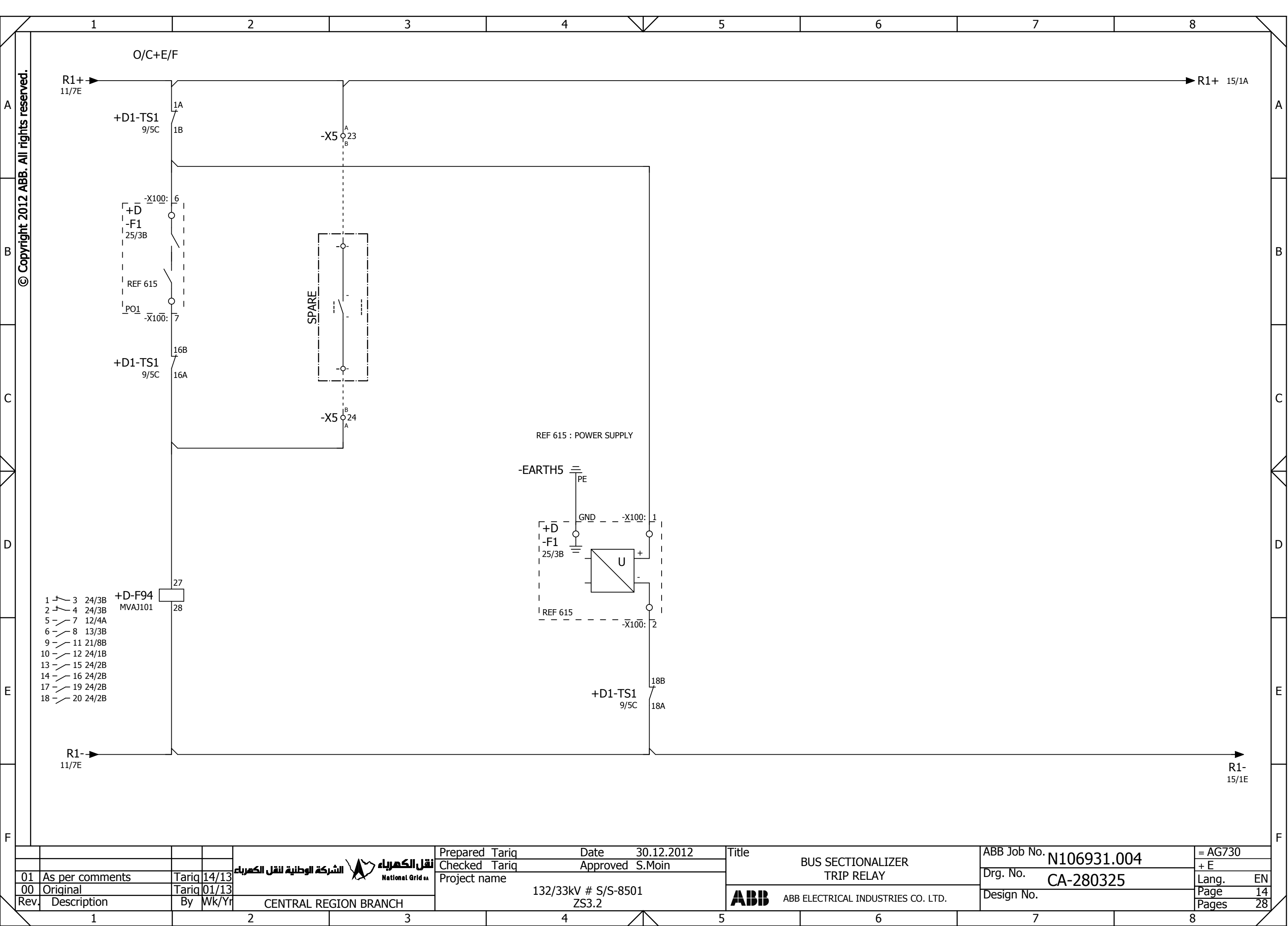
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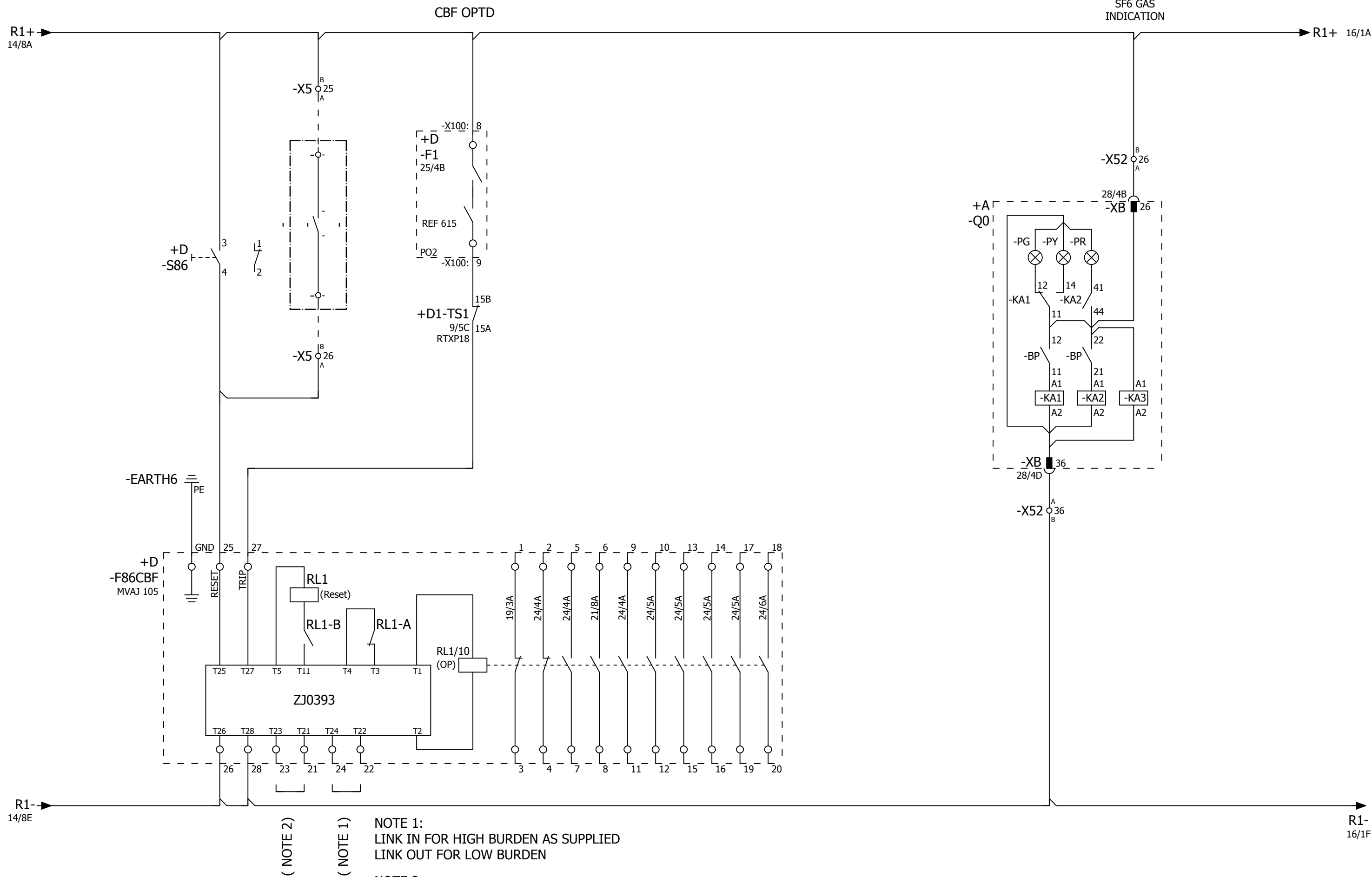


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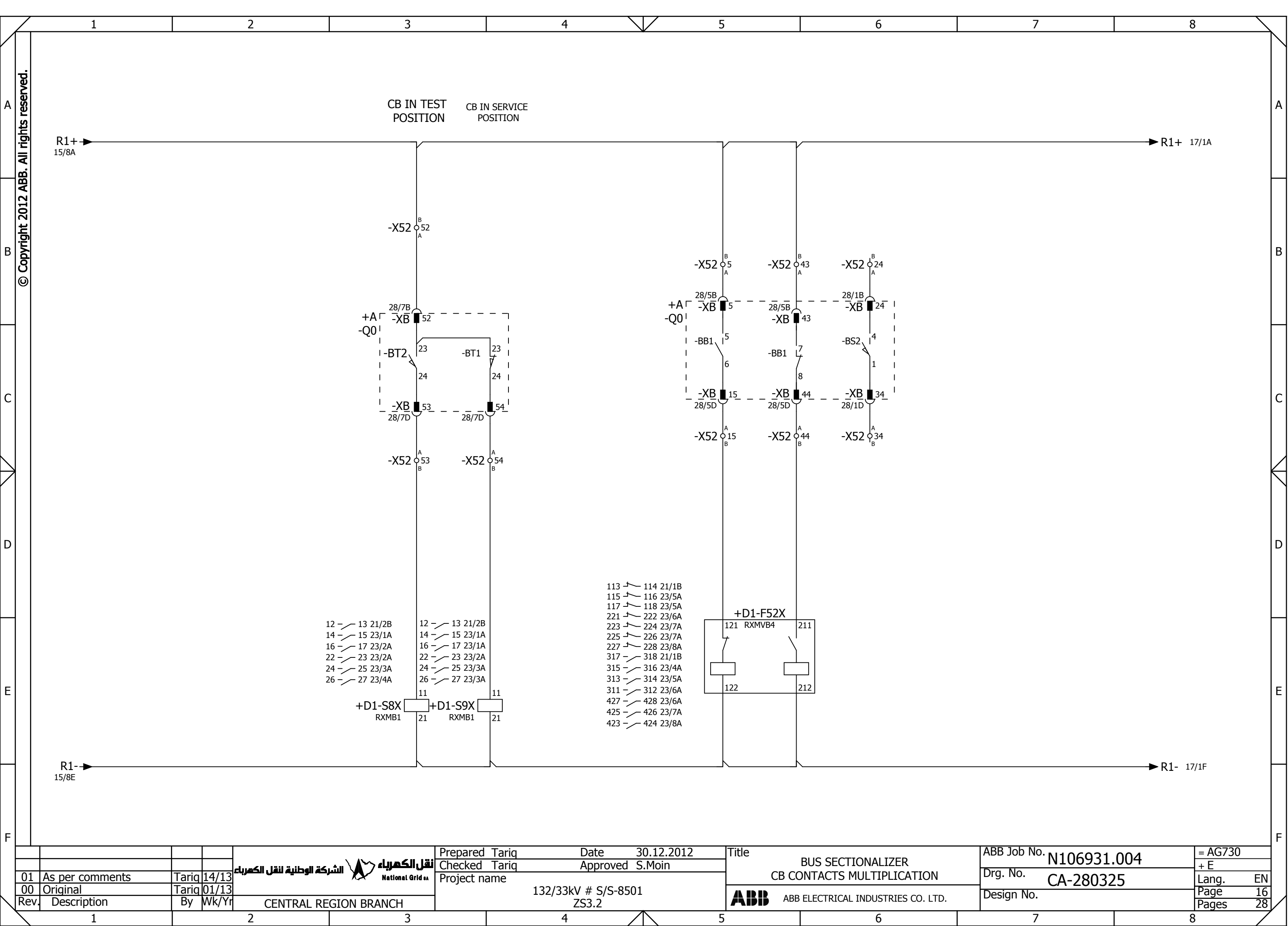


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00	Original	Tariq	01/13									Page 13			
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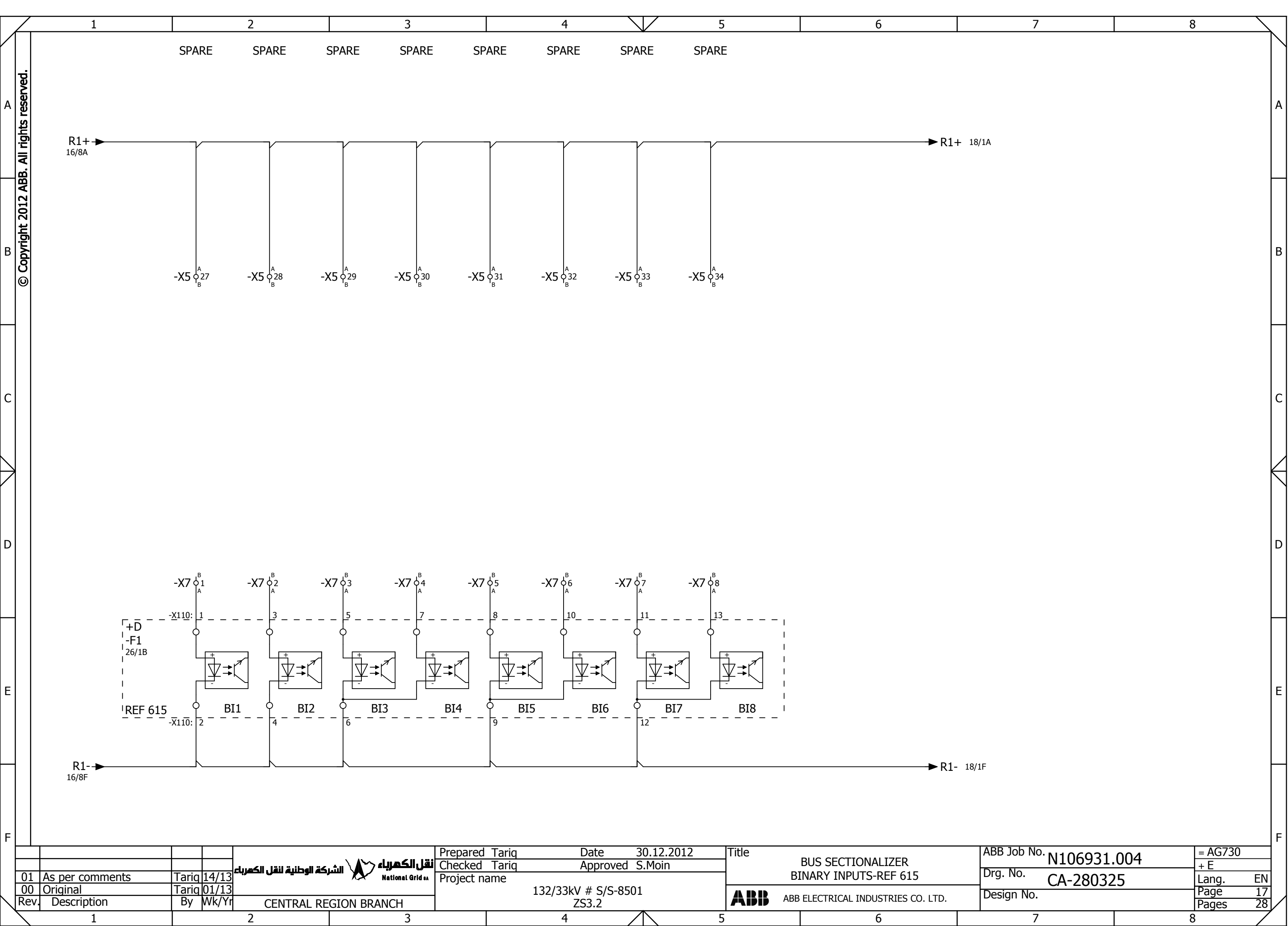
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Rev.	Description	By	Wk/Yr	

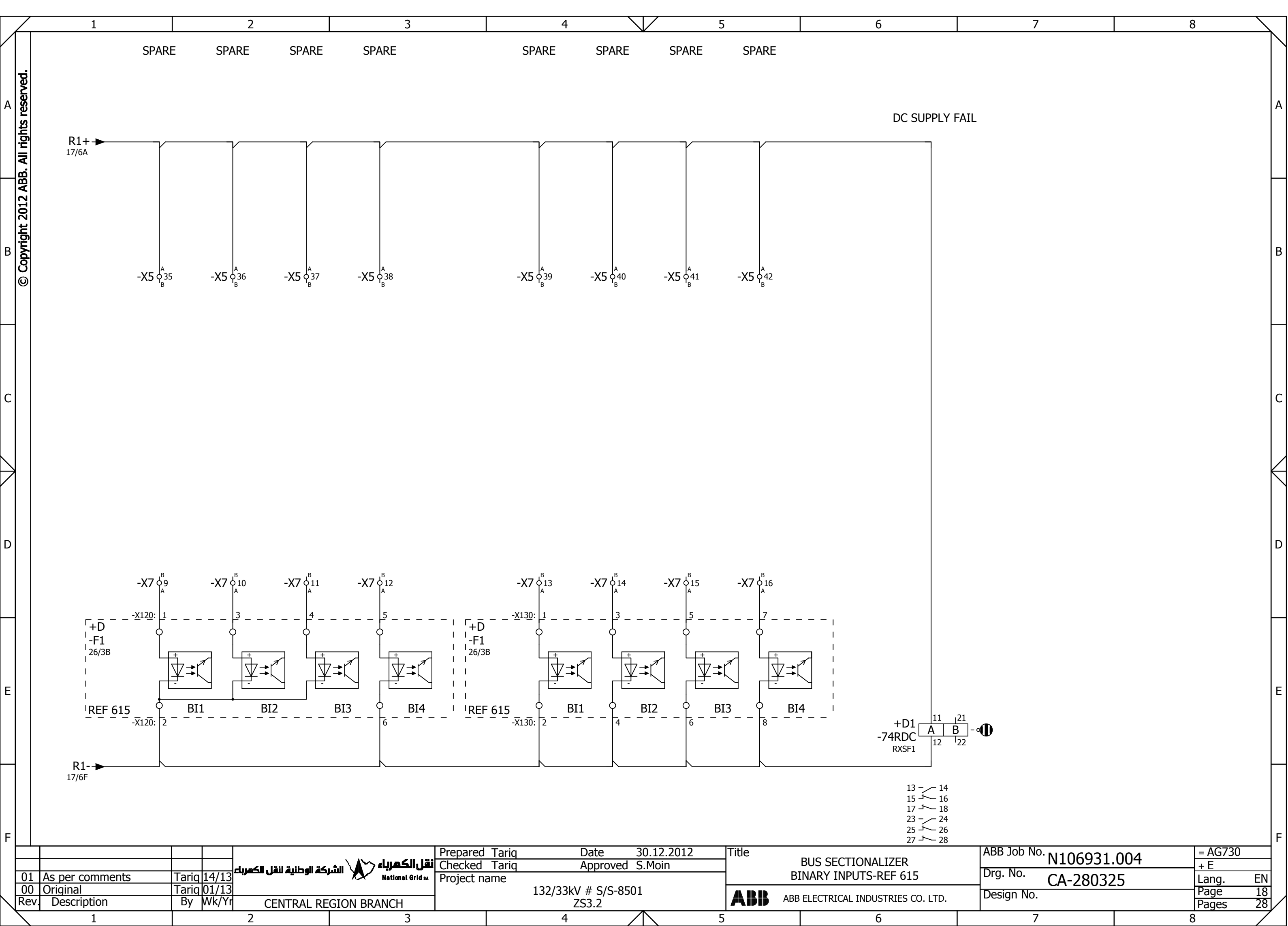
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Checked Tariq	Approved S.Moin
Project name	
132/33kV # S/S-8501	
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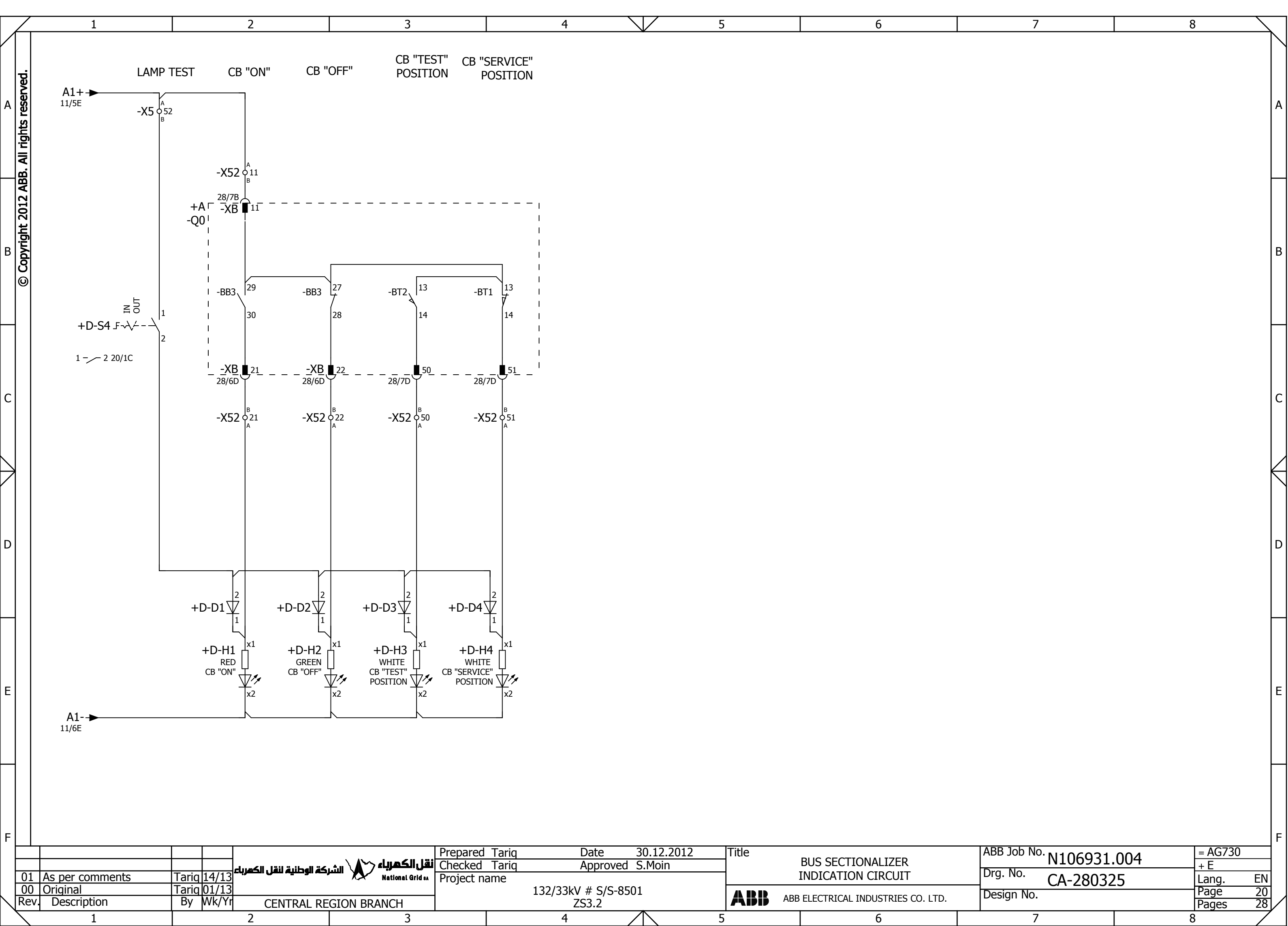
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ABB Job No.	N106931.004	= AG730
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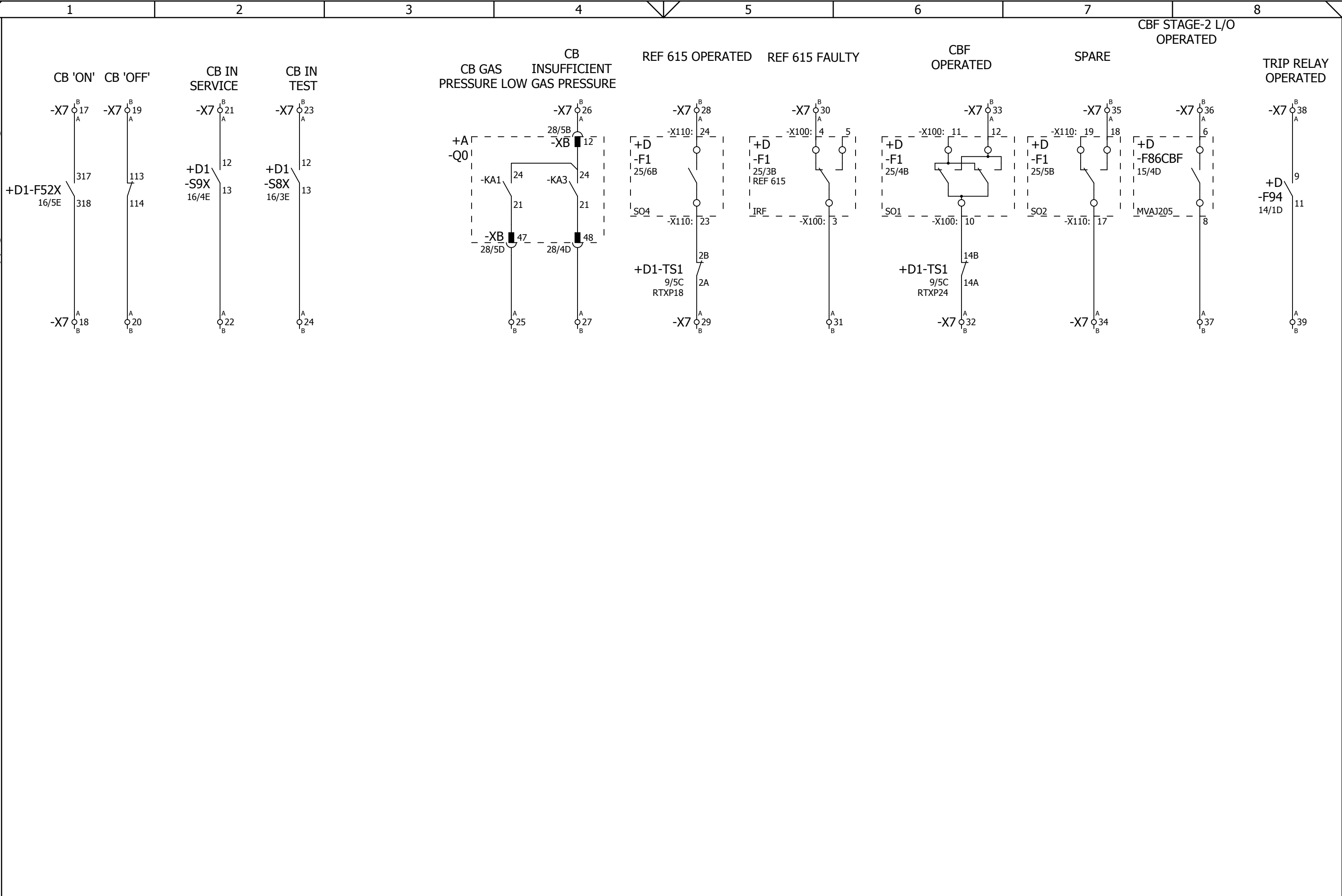
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Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name 132/33kV # S/S-8501 ZS3.2	

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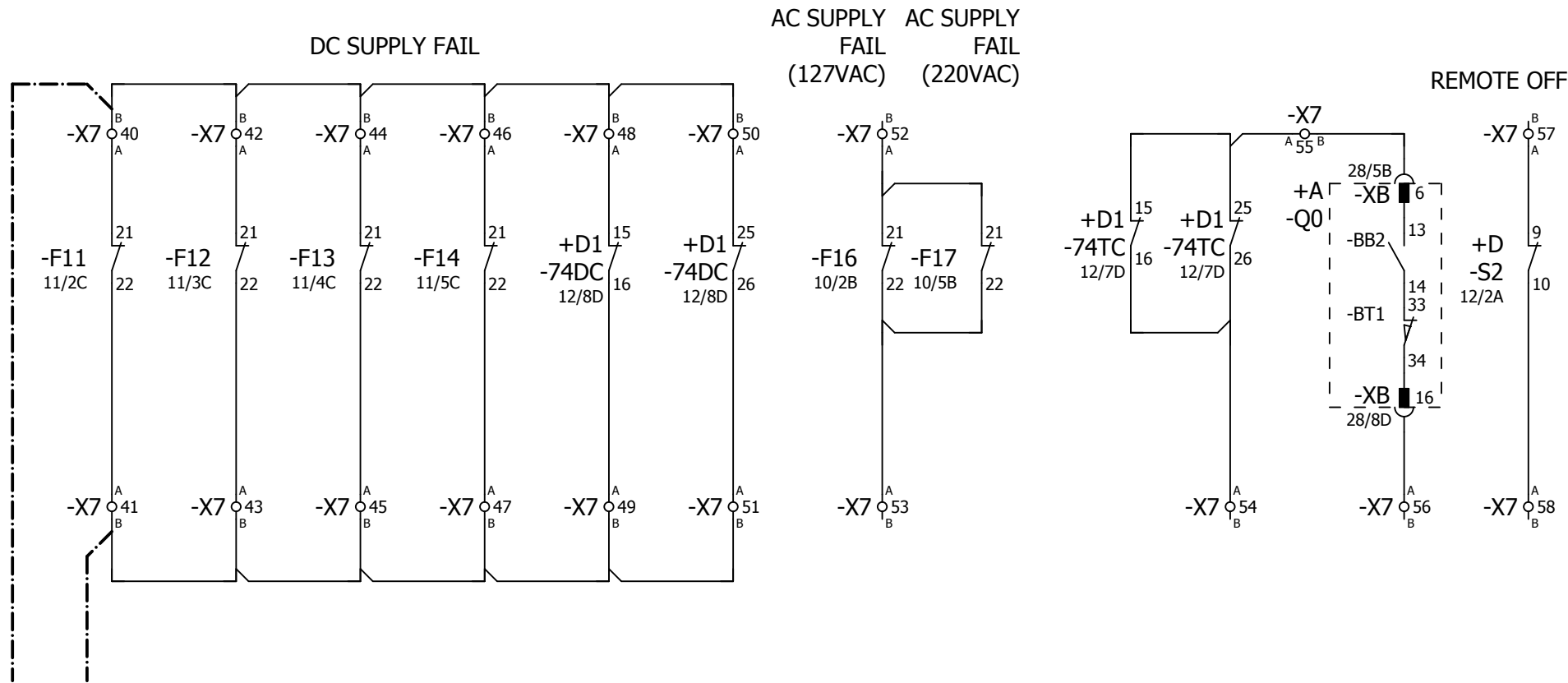
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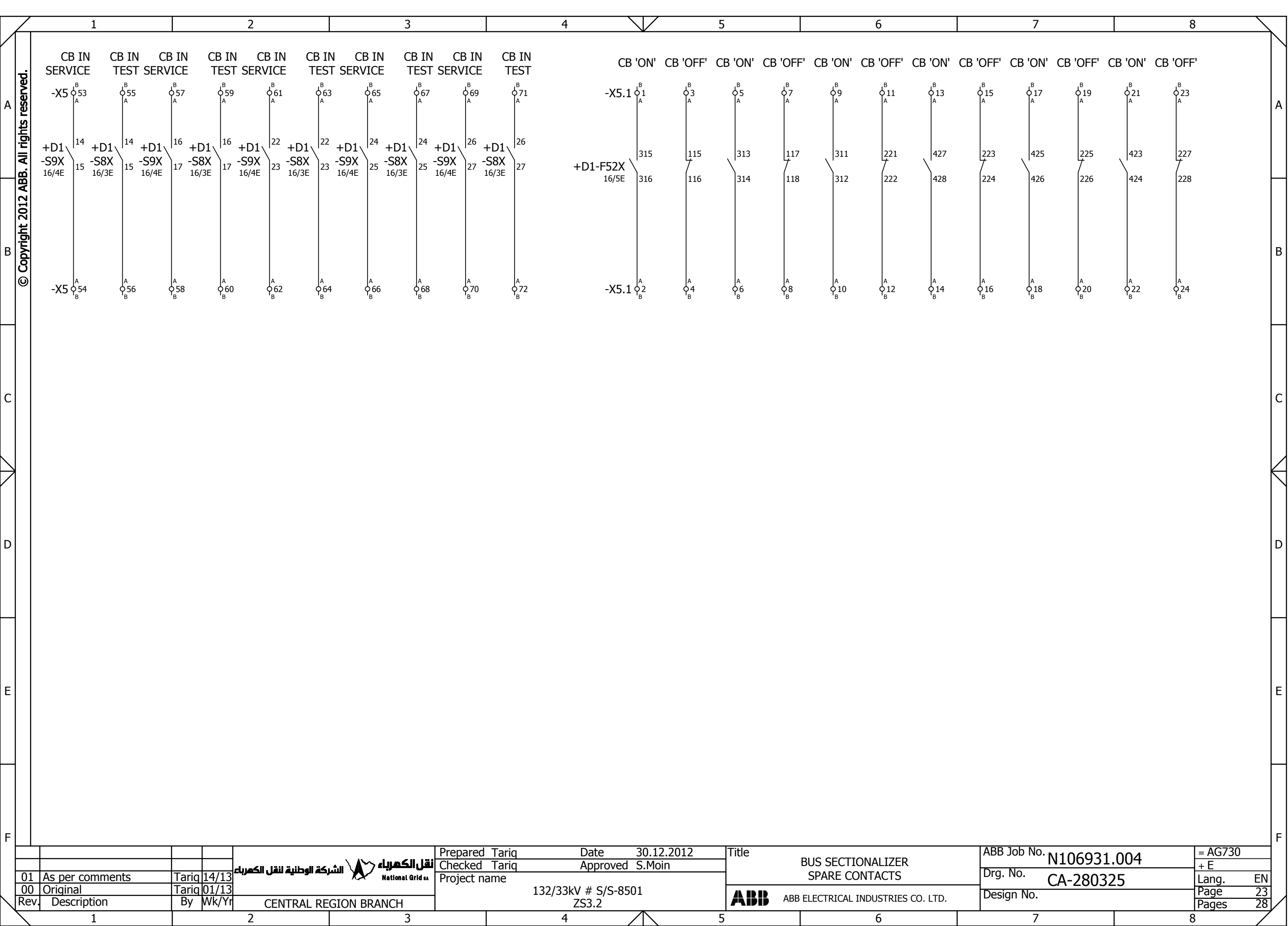


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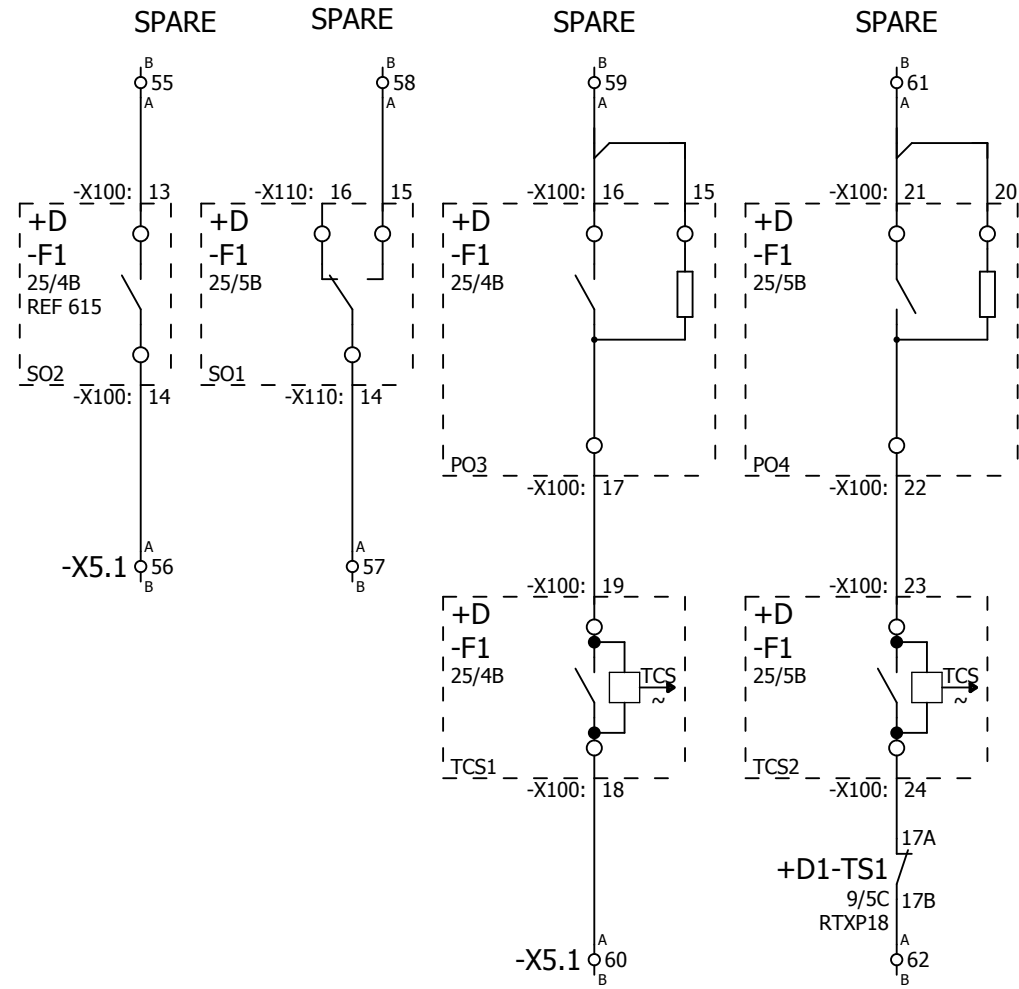
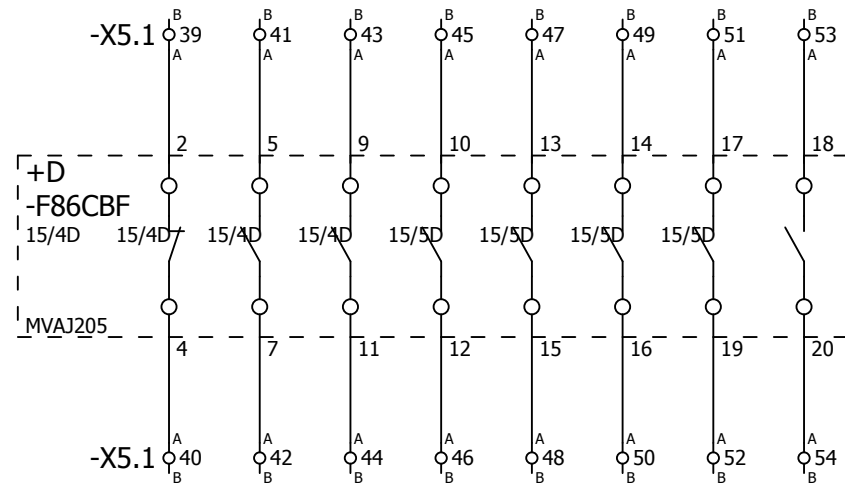
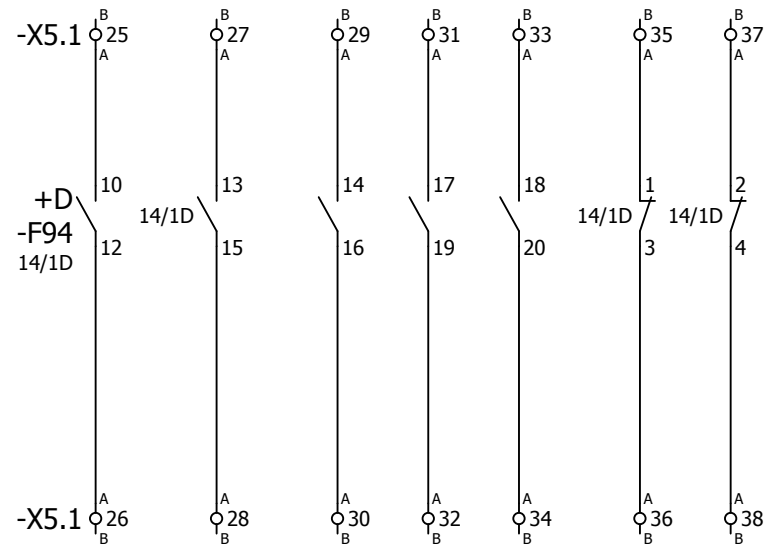
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title	BUS SECTIONALIZER CONTACTS TO SCADA ALARM	ABB Job No. N106931.004	= AG730
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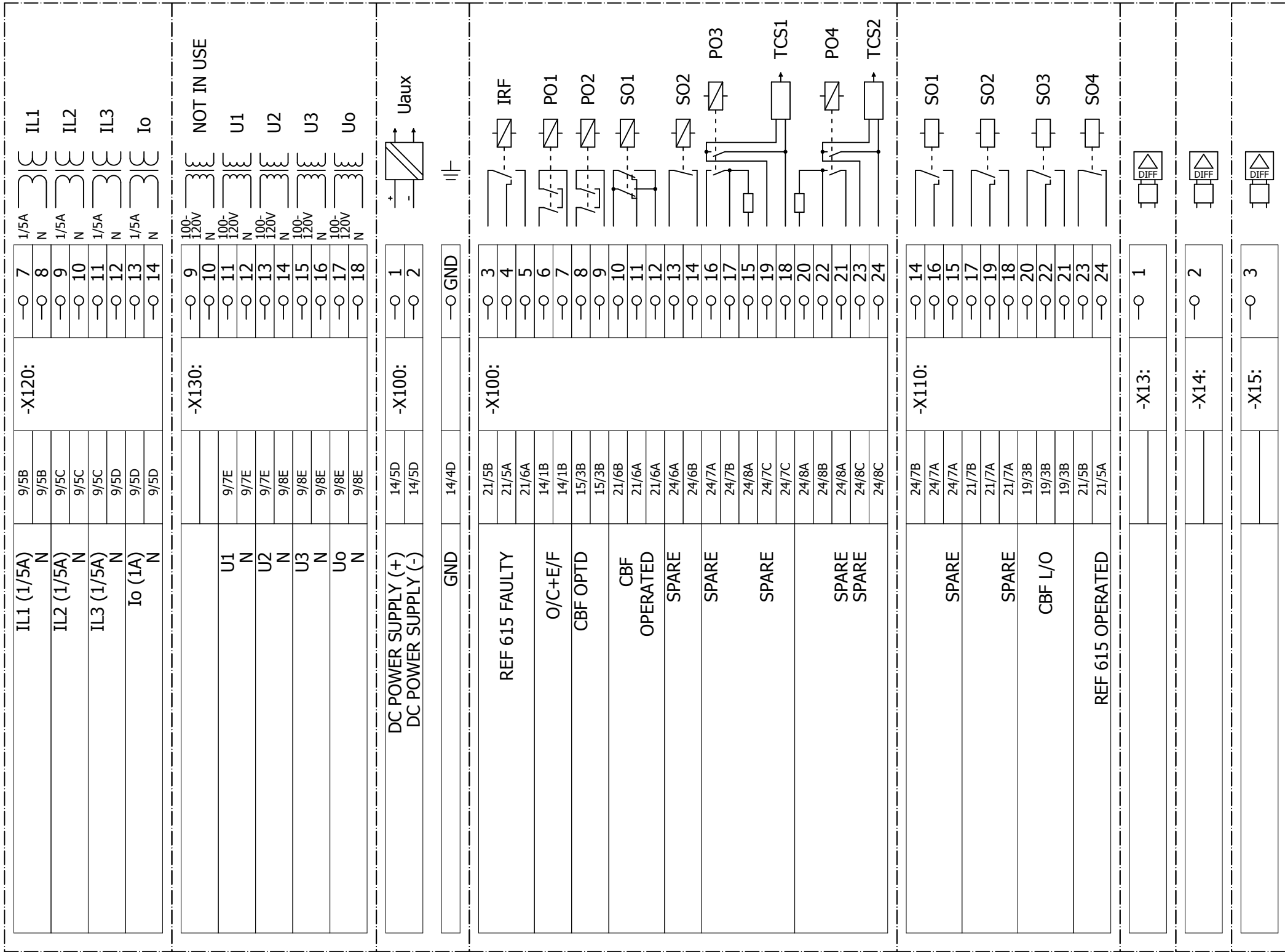


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00	Original	Tariq	01/13					Page 24
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+D-F1

REF 615

REF 615 : BACK UP O/C +E/F RELAY



REF 615

				<div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title	BUS SECTIONALIZER REF615 - A/I + Binary I/O Board	ABB Job No. N106931.004	= AG730
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BI8



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-X110:

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SPARE

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Prepared Tariq

Date 30.12.2012

Title

BUS SECTIONALIZER

REF615 BINARY INPUTS

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ABB ELECTRICAL INDUSTRIES CO. LTD.

Checked Tariq

Approved S.Moin

Project name

132/33kV # S/S-8501

ZS3.2

ABB Job No.

N106931.004

Drg. No.

CA-280325

Design No.

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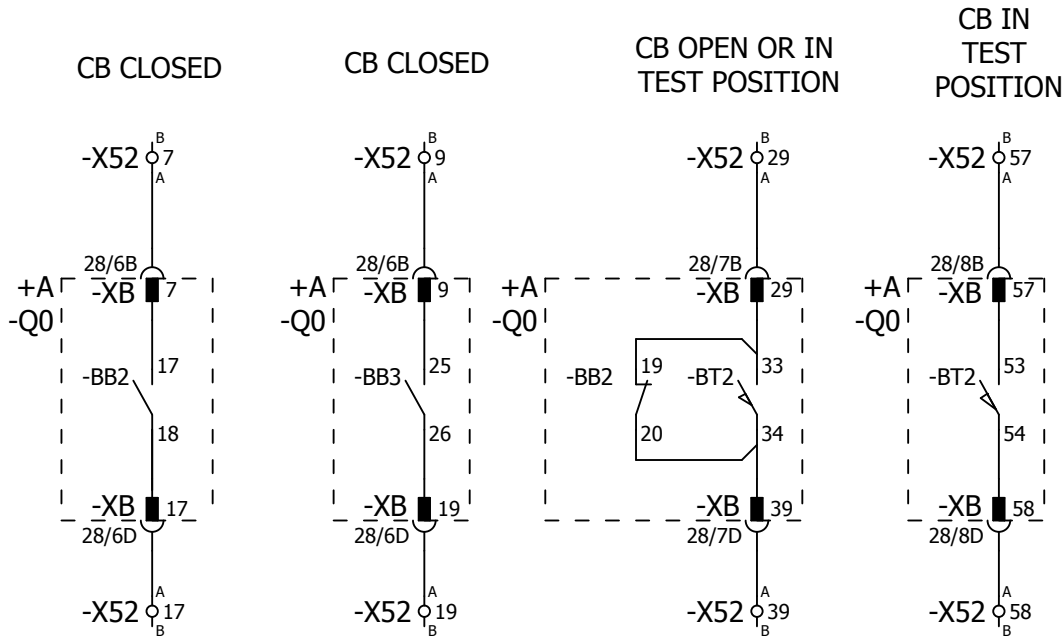
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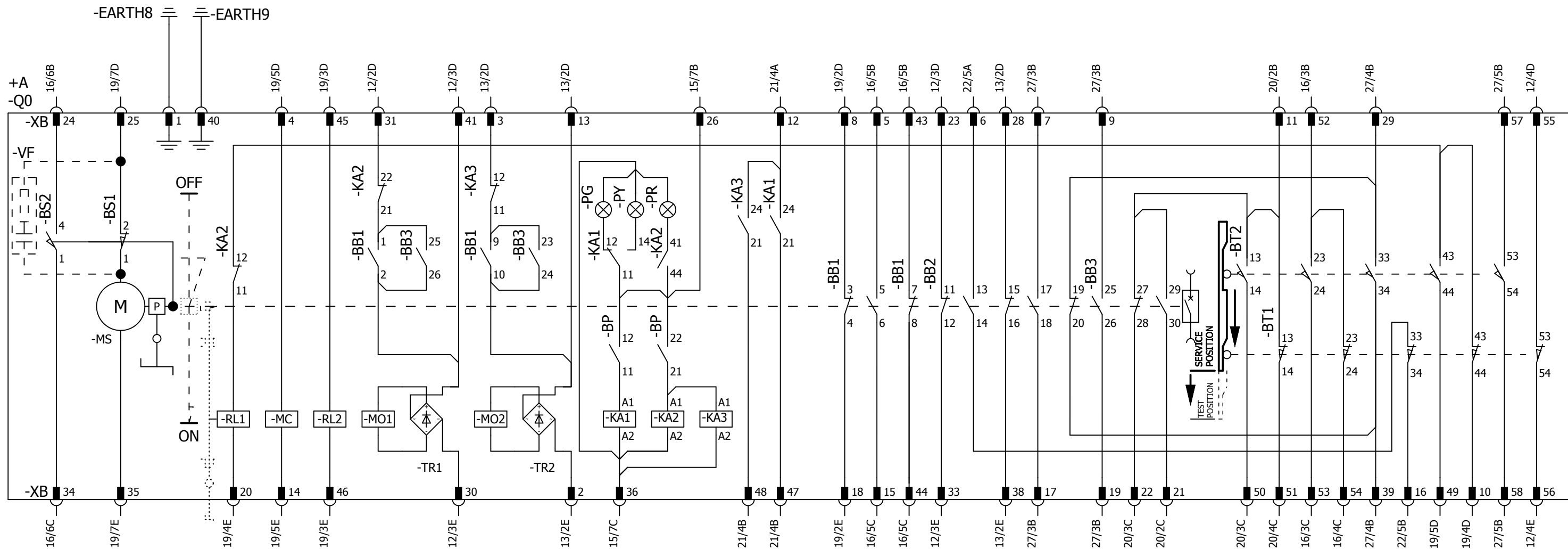
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01	As per comments	Tariq	14/13	Project name 132/33kV # S/S-8501 ZS3.2		BUS SECTIONALIZER HD4 SPARE CONTACTS	Design No.	Lang. EN
00	Original	Tariq	01/13					Page 27
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HD4

DOC. No: 1VCZ400054

Figures: 1, 2, 3, 4, 7, 9, 14, 22, 32, 51

CB OPEN, TRUCK IN SERVICE POSITION, SPRING NOT CHARGED



SPARE TERMINALS

- X2 ϕ_7^B ϕ_8^B ϕ_9^B ϕ_{10}^B
- X3 ϕ_{12}^B ϕ_{13}^B
- X4 ϕ_{21}^B ϕ_{22}^B ϕ_{23}^B ϕ_{24}^B ϕ_{25}^B
- X5.1 ϕ_{63}^B ϕ_{64}^B ϕ_{65}^B ϕ_{66}^B ϕ_{67}^B ϕ_{68}^B ϕ_{69}^B ϕ_{70}^B ϕ_{71}^B ϕ_{72}^B ϕ_{73}^B ϕ_{74}^B ϕ_{75}^B ϕ_{76}^B ϕ_{77}^B
- X7 ϕ_{59}^B ϕ_{60}^B ϕ_{61}^B ϕ_{62}^B ϕ_{63}^B ϕ_{64}^B ϕ_{65}^B
- X11 ϕ_{12}^B ϕ_{13}^B
- X12 ϕ_{15}^B ϕ_{16}^B
- X52 ϕ_{40}^B ϕ_{42}^B ϕ_{47}^B ϕ_{48}^B ϕ_1^B ϕ_{16}^B ϕ_{27}^B ϕ_{37}^B
- X87 ϕ_9^B ϕ_{10}^B

DESIGNAT.	FIGURE	DESCRIPTION	DESIGNAT.	FIGURE	DESCRIPTION
-MS	Fig.1	MOTOR FOR SPRING CHARGING	-PG	Fig.14	GREEN LED - NORMAL GAS PRESSURE
-BS1	Fig.1	CLOSING SPRINGS DISCHARGED	-PY	Fig.14	YELLOW LED - LOW GAS PRESSURE
-MC	Fig.2	SHUNT RELEASE ON	-PR	Fig.14	RED LED - INSUFFICIENT GAS PRESSURE
-RL1	Fig.3	BLOCKING MAGNET AGAINST CB CLOSING	-BS2	Fig.22	CLOSING SPRING CHARGED
-RL2	Fig.4	BLOCKING MAGNET AGAINST TRUCK MOVING			
-MO1	Fig.7	FIRST SHUNT RELEASE OFF	-BB1	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR1	Fig.7	RECTIFIER FOR COIL -MO1	-BB2	Fig.32	AUXILIARY SWITCH CB SHAFT
-MO2	Fig.9	SECOND SHUNT RELEASE OFF	-BB3	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR2	Fig.9	RECTIFIER FOR COIL -MO2	-BT1	Fig.51	CB TRUCK IN SERVICE (CONNECTED) POSITION
-KA1	Fig.14	AUX. RELAY - LOW GAS PRESSURE	-BT2	Fig.51	CB TRUCK IN TEST (ISOLATED) POSITION
-KA2	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XB		58-POLE PLUG FOR AUXILIARY CIRCUITS
-KA3	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XG		GROUND TERMINALS

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1 of 35

CA-289326

P

C424

11131061/00

JOB ORDER / CONTRACT NO.

REV. NO.

Rating Plate

ABB

ABB Electrical Industries Co. Ltd. Saudi Arabia

Type	: ZS3.2
Serial No.	: 1YAN106931B0408
Year of Manufacturing	: 2013
Contract No.	: 11131061/00
Substation	: 132/33kV # S/S-8501
Specification No.	: 32-TMSS-01, Rev. 01
Rated Voltage	: 36kV
Service Voltage	: 33kV
Auxiliary Voltage AC / DC	: 127/220 VAC / 125 VDC
Rated Insulation Level	: 36 / 70 / 170 kV
Rated Frequency	: 60Hz
Rated Short Time Withstand Current	: 25kA / 1sec
Rated Peak Withstand Current	: 63kA
Rated Normal Current of Busbars	: 2000 A
Rated Normal Current of Tee-off	: 2000A
Ambient Temperature	: 40° C

NOTES

LEGEND

REFERENCE DRAWINGS

DRAWING TITLE		DRAWING NO.
XXXXX		XXXXX
XXXXX		XXXXX

ABB

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AS-BUILT		BY	DATE			
01	14/13	Tariq	As per comments	Tariq		S.Moin
00	01/13	Tariq	Original	Tariq		S.Moin
REV. NO.	DATE	BY	DESCRIPTION	CHKD.	CERT.	APPD.

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نقل الكهرباء

National Grid

CENTRAL REGION BRANCH

DRAWN BY

Tariq

CHECKED BY

Tariq

SCALE

DATE STARTED

30.12.2012

DATE COMPLETED

OPRG. DEPT.

ENG. DEPT.

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MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED
BY
DATE

COVER SHEET

INCOMING 100MVA FEEDER (1875)
132/33kV # S/S-8501

SAUDI ARABIA

ABB CUBICLE NO.	SEC CUBICLE NO.	EARTH SWITCH NO.				
= AG18						
ABB JOB NO.	JOB ORDER / CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
N106931.004	11131061/00	C424	P	CA-289326	1 of 35	00

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

DRAWING NUMBER	SHEET NO.	REV. NO.
CA-289326	1 of 35	00

S:\SWG Projects DRGS\SEC-COA\N106931-04 SS-8170-8178-8833-8501\Detail Design\8501

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This typical is also valid for: AG18

SHEET INDEX

Pages	Page name	Rev	Description	Rev	Description	Rev	Description	Rev	Description
=AG18+E/1	COVER SHEET	00	Original	01	As per comments				
=AG18+E/2	SHEET INDEX	00	Original	01	As per comments				
=AG18+E/3	Apparatus List	00	Original	01	As per comments				
=AG18+E/4	Terminal Block Schedule	00	Original	01	As per comments				
=AG18+E/5	Single Line Diagram	00	Original	01	As per comments				
=AG18+E/6	Cubicle Assembly	00	Original	01	As per comments				
=AG18+E/7	Low Voltage Box Arrangement	00	Original	01	As per comments				
=AG18+E/8	CT CORE1-TRANSFORMER PROTECTION	00	Original	01	As per comments				
=AG18+E/9	CT CORE2-BACKUP O/C+E/F PROTECTION	00	Original	01	As per comments				
=AG18+E/10	CT CORE3-METERING	00	Original	01	As per comments				
=AG18+E/11	CT CORE4-87B PROTECTION	00	Original	01	As per comments				
=AG18+E/12	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG18+E/13	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
=AG18+E/14	VOLTAGE TRANSFORMER CIRCUIT	00	Original	01	As per comments				
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=AG18+E/17	AC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG18+E/18	DC SUPPLY CIRCUITS	00	Original	01	As per comments				
=AG18+E/19	TRIP CIRCUIT-1 & SUPERVISION	00	Original	01	As per comments				
=AG18+E/20	TRIP CIRCUIT-2 & SUPERVISION	00	Original	01	As per comments				
=AG18+E/21	TRIP RELAY	00	Original	01	As per comments				
=AG18+E/22	CBF STAGE-2 LOCKOUT RELAY	00	Original	01	As per comments				
=AG18+E/23	CB CONTACTS MULTIPLICATION	00	Original	01	As per comments				
=AG18+E/24	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG18+E/25	BINARY INPUTS-REF 615	00	Original	01	As per comments				
=AG18+E/26	CLOSING CIRCUIT/CB SPRING CHARGE MOTOR	00	Original	01	As per comments				
=AG18+E/27	INDICATION CIRCUIT	00	Original	01	As per comments				
=AG18+E/28	CONTACTS TO SCADA INDICATION	00	Original	01	As per comments				
=AG18+E/29	CONTACTS TO SCADA ALARM	00	Original	01	As per comments				
=AG18+E/30	SPARE CONTACTS	00	Original	01	As per comments				
=AG18+E/31	SPARE CONTACTS (REF 615)	00	Original	01	As per comments				
=AG18+E/32	REF615 - A/I + Binary I/O Board	00	Original	01	As per comments				
=AG18+E/33	REF615 BINARY INPUTS	00	Original	01	As per comments				
=AG18+E/34	HD4 SPARE CONTACTS	00	Original	01	As per comments				
=AG18+E/35	HD4 INTERNAL WIRING	00	Original	01	As per comments				

				<div><div><div>الشركة الوطنية لنقل الكهرباء</div><div></div><div>National Grid SA</div></div></div>	Prepared Tariq	Date	30.12.2012	Title	INCOMING 100MVA FEEDER (1875) SHEET INDEX	ABB Job No. N106931.004	= AG18
					Checked Tariq	Approved	S.Moin				
1	As per comments	Tariq	14/13			Project name				Drg. No. CA-289326	Lang. EN
0	Original	Tariq	01/13			132/33kV # S/S-8501		 ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Page 2	
ev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH		ZS3.2				Pages 35	

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Item Number	Component number	Object description	Comp. Qty (CUn)				
+A-Q0	HD4-402025-125V	SF6 CB:HD4/Z40.20.25(FOR ZS3.2-125VDC	1	+D1-741-4	MV RS 702 290-AA	SPER1C1/E255:RS 702 290-AA -w/o LED-TCS	4
+C-CT1-3	CT-N106931-33KV-IC	ABB EJF : TPU76.63 BIL:36/70/170kV, Frequency : 60Hz. Ambient temp: 40C Ith : 25kA (1 sec) IDYNAMIC/Peak :65kA (2.6 times the Ith as per IEC for 60hz). Thermal over current factor: 1.2 for single ratio Primary terminal silver plated. Secondary Reconnect able CORE 1- RATIO : 1200-2400/1A CLASS : PX Vkp: 300V - 600V Rct : 3 Ohms - 6 Ohms Io : 0.05A - 0.05A CORE 2- RATIO : 1200-2400/1A CLASS : PX Vkp: 300V - 600V Rct : 3 Ohms - 6 Ohms Io : 0.05A - 0.05A CORE 3- RATIO : 400-800/1A CLASS : 0.2Fs5 BURDEN : 15-30VA CORE 4- RATIO : 2000/1A CLASS : PX Vkp : 350V Io : 30mA Rct : 5 Ohms	3	+D1-74DC	MV RK 271 019-AN	RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-74RDC	MV RK 271 019-AN	RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-74TC	MV RK 271 019-AN	RXSF1DC110-125v(0V-FlgS-RST)2Stak1NO2NC-	1
				+D1-TS1	MV RK 926 115-BF	RELAY TEST SWITCH: RTXP18:RK 926 115-B	2
				+D1-TS87B	MV RK 926 002-AD	RTXP8	1
				+D-CVI	1YAB010028R0105	CVI(VOIS)36/40.5kV COMPLET W. INSULATORS	1
				+D-F1	HBFJAEAGNEA1BAA1XE	REF615 -4I+5U-16BI+10BO+IEC61850	1
				+D-F86CBF	MV-MVAJ105RA0802	Lockout Relay for CBF stage-2(8 NO + 2 NC)	1
				+D-F94	MV-MVAJ101-RA-0802	MVAJ101 , (8 NO + 2 NC)	1
				+D-H1	LED-125V-RESDIOD-R	LED48 -125VDC, Resistr+Diode22 DIA, RED	1
				+D-H2	LED-125V-RESDIOD-G	LED48 -125VDC, Resistr+Diode22DIA, GREEN	1
				+D-H3-4	LED-125V-RESDIOD-W	LED48-125VDC, Resistr+Diode 22 DIA,WHITE	2
				+D-H5	LED-125V-RESDIOD-Y	LED48-125VDC, Resistor+Diode,22D,YELLOW	1
				+D-P1	MV-V96LI-110-33KV	VOLTMETER, Type: V96LI-VT-A, 33000/110KV	1
				+D-P2	MV-A96LI-1A-800-DS	AMMETER, Type : A96LI-CT-A, 800-400/1A	1
				+D-P3	MV-M96D-1A-800-DS	MDI(built-in CT)Type: M96D_30,800-400/1A	1
				+D-S1	CA10-A216-FUAP530	CB OPEN-NORMAL-CLOSE-Padlock.red handle	1
				+D-S2	CA10-A223-FUAP531	BREAKER MODE SW. LOC/REM 20A 4P 2Positn	1
				+D-S3	CA10-A260-FUAP534	Space heater SW "Off-Auto-Manual" (K&N)	1
				+D-S4	CA10-A204-FUAP535	Lamp Test Switch (K&N)	1
				+D-S5	CA10-A007-VMTR	Voltmeter Sel. Switch (K&N)	1
				+D-S6	CHR10-A038-AMTR	Ammeter Selector Switch (K&N)	1
				+D-S86	MV-1SFA616100R4076	PB Black 1NO+1NC-22 dia-1SFA611100R4076	1
				+D-TSM	MV-129A514G01	FT-1 SW-FOR METERING CT/VT ISOL.(6C+4P)	1
				+E-E2	DMS 3110	THERMOSTAT 24,48,60,115 & 230V	1
				+E-E4	MV 5911 0818-01	FLUORESCENT LAMP WITH DIFFUSER, 120VAC	2
				+E-EC	GCE0990162P0101	PANEL HEATER 240V,50W-Boxin-3Met.Cable	1
				+E-F11-15	MV-S 282 UC-K6	MCB 6A DC -2P	5
				+E-F16	MV-S 202-K16	MCB 2 POLE 16A -AC	1
				+E-F17	MV-S 202-K10	MCB 2 POLE 10A -AC	1
				+E-F20-21	MV-S 203-K10	MCB 3 Pole 10 Amp.	2
				+E-F22-27	MV-S 203-K4	MCB -3POLE-4A -AC	6
				+E-X10	AE2000-5380-03	POWER OUTLET 125VAC 15A (GE) DUAL TYPE	1
				+E-X20	AE2000-5380-01	POWER OUTLET 250VAC -10A (GE) DUAL TYPE	1
					MV-S2C-H11L	.Ux contact 1NO+1NC AC -MCB	2
					MV-S2-H11	Aux contact for DC MCB 1No+1NC	5
					MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1
					DMS 924 0004	COMBIFLEX TERMINAL BASE RX 2H (4U 6C)	1
					DMS 924 0002	COMBIFLEX TERMINAL BASE RX4 (4U 12C)	1
+C-VT1,2,3	TJP7-N106931-VT	TYPE : TJP7.1 AS PER LATEST IEC STD. SPECS. Ambient Temp: 40C BIL : 36/70/170kV FREQUENCY : 60Hz PRIMARY VOLTAGE : 33000/1.732V SECONDARY VOLTAGE1 WINDING : 110/1.732V BURDEN : 25VA CLASS : 0.2/3P SECONDARY VOLTAGE2 WINDING : 110/1.732V BURDEN : 25VA CLASS : 0.2/3P VOLTAGE RATING FACTOR : 1.9xUn for 8HOURS :1.2 x Un CONTINUOUS	3				
+C-VTF1,2,3	AE4754-2000-02	VT pri FUSE ZS3.2-36KV2A type17CAV,440MM	3				
+C-EC	AE5858-2004-AB	SPACE HEATER 220V AC, 150-200W	1				
+C-Q2	GCE7005552R0101	EARTH SWITCH-EK6, 36KV, 31.5KA	1				
+C-Q2.Y8	GCE9401766P0107	BLOCKING MAGNET, 125VDC	1				
+D-D1	MV-RK 927 004-AB	COMBIFLEX RELAY CASE,TYPE:RHGX20, 4U-60C	1				
+D1-98	MV RK 271 007-AN	RXSF1, 2 (2NO+1NC) HAND RESET FLAG	1				
+D1-F98	MV-RXBA4-120VAC	3PH. FUSE SUPERVISION RELAY: RXBA4	1				
+D1-S8X	MV RK 000 863-AN	AUXILIARY RELAY: RXMB1 6NO-110-125VDC	1				
+D1-S9X	MV RK 000 863-AN	AUXILIARY RELAY: RXMB1 6NO-110-125VDC	1				
+D1-F52X	MV RK 251 401-AP	BISTABLE RELAY, RXMBV 4 : RK 251 401-AP	1				

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				 الشركة الوطنية لنقل الكهرباء National Grid SA	Prepared Tariq	Date 30.12.2012	Title INCOMING 100MVA FEEDER (1875) Apparatus List  ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No. N106931.004	= AG18	
					Checked Tariq	Approved S.Moin			Drg. No. CA-289326	+ E
01	As per comments	Tarig	14/13		Project name					Lang. EN
00	Original	Tarig	01/13		132/33kV # S/S-8501 ZS3.2			Design No.	Page 3	
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH					Pages 35	

1		2		3		4		5		6		7		8	
TERMINALS															
NAME	TYPE		REMARK			QUANTITY		FUNCTION							
X3	USST4					13		CONTROL CIRCUIT							
X4	USST4					25		CONTROL CIRCUIT							
X5	USST4					98		CONTROL CIRCUIT							
X5.1	USST4					77		CONTROL CIRCUIT							
X7	WTR-4SL					70		SCADA CIRCUIT							
X11	OTTA6-T-P/P					16		CT CIRCUIT							
X12	OTTA6-T-P/P					19		CT CIRCUIT							
X13	OTTA6-T-P/P					22		CT CIRCUIT							
X14	OTTA6-T-P/P					13		CT CIRCUIT							
X52	USST4					55		CB CIRCUIT							
X87	OTTA6-T-P/P					10		CT CIRCUIT							
X2	WTL6SL					36		VT CIRCUIT							

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As per comments

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Description

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National Grid sa

CENTRAL REGION BRANCH

Prepared Tariq

Checked Tariq

Project name

Date 30.12.2012

Approved S.Moin

132/33kV # S/S-8501
ZS3.2

Title

INCOMING 100MVA FEEDER (1875)
Terminal Block Schedule

ABB

ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.

Drg. No.

Design No.

N106931.004

CA-289326

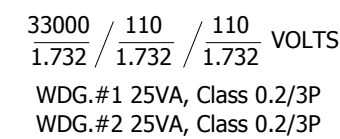
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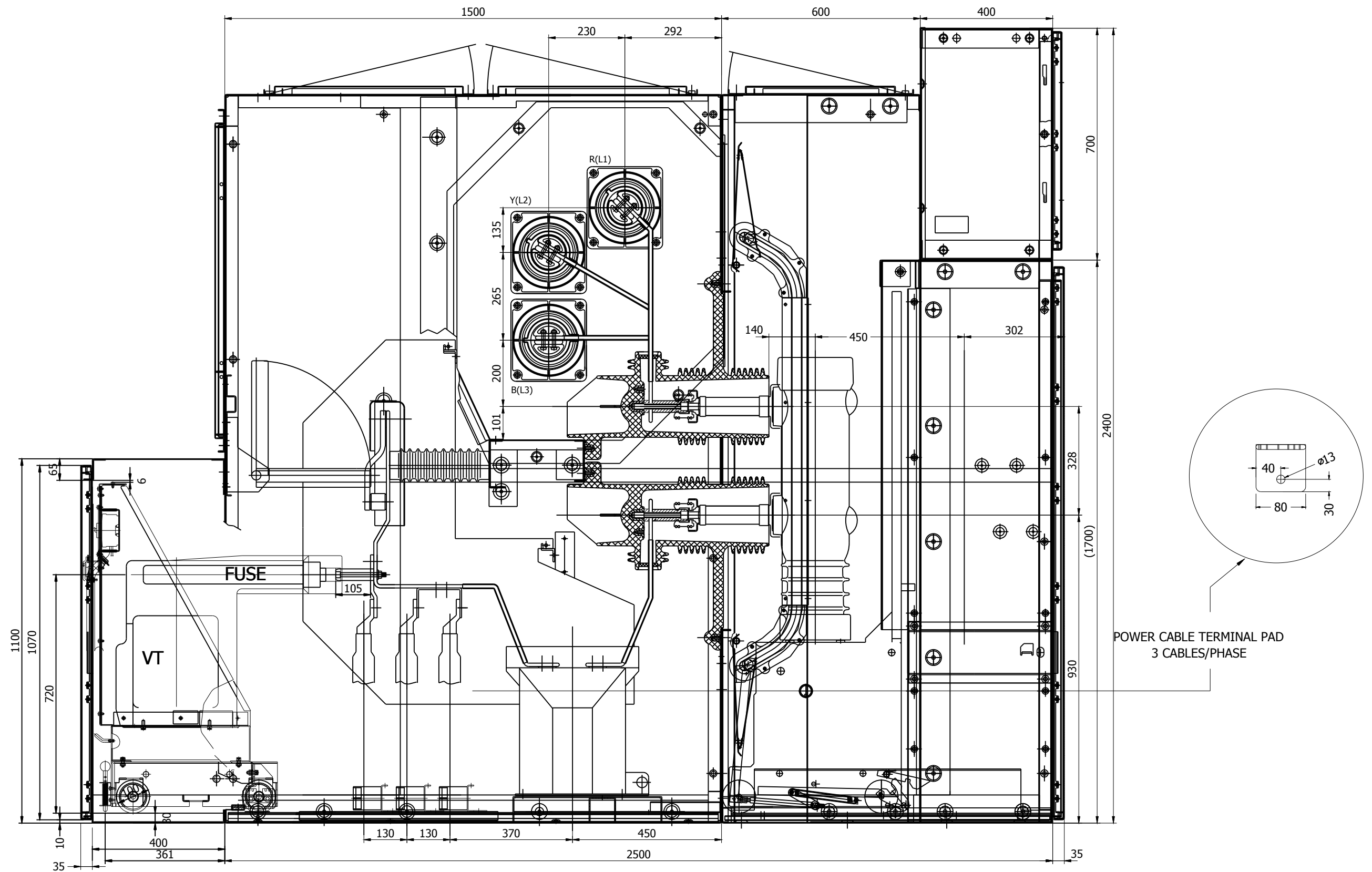
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date	30.12.2012	Title	INCOMING 100MVA FEEDER (1875) Cubicle Assembly	ABB Job No.	N106931.004	= AG18		
					Checked Tariq	Approved	S.Moin					+ E		
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name	132/33kV # S/S-8501 ZS3.2	<div>ABB</div> ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No.	CA-289326	Lang.	EN		
00	Original	Tariq	01/13										Page	6
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- +D.H1 - CB "ON"
- +D.H2 - CB "OFF"
- +D.H3 - CB "TEST" POSITION"
- +D.H4 - CB "SERVICE" POSITION"
- +D.H5 - Earth switch "ON"

- +D.S1 - Breaker control switch, OPEN-NORMAL-CLOSE
- +D.S2 - LOCAL/REMOTE SWITCH
- +D.S3 - SPACE HEATER SELECTOR SWITCH
- +D.S4 - LAMP TEST SWITCH
- +D.S5 - VOLTMETER SELECTOR SWITCH
- +D.S6 - AMMETER SELECTOR SWITCH
- +D.S79 - AUTORECLOSE IN/OUT SWITCH
- +D.S86 - CBF RESET

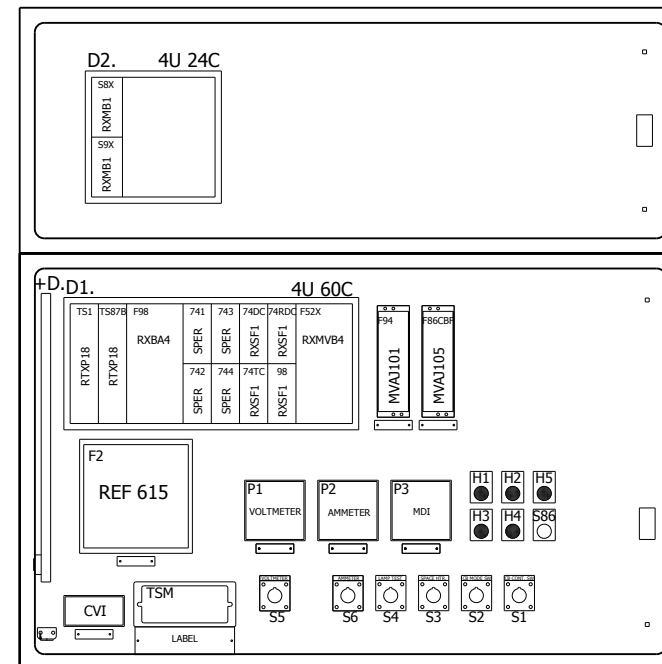
Rear plate +E.

400 mm

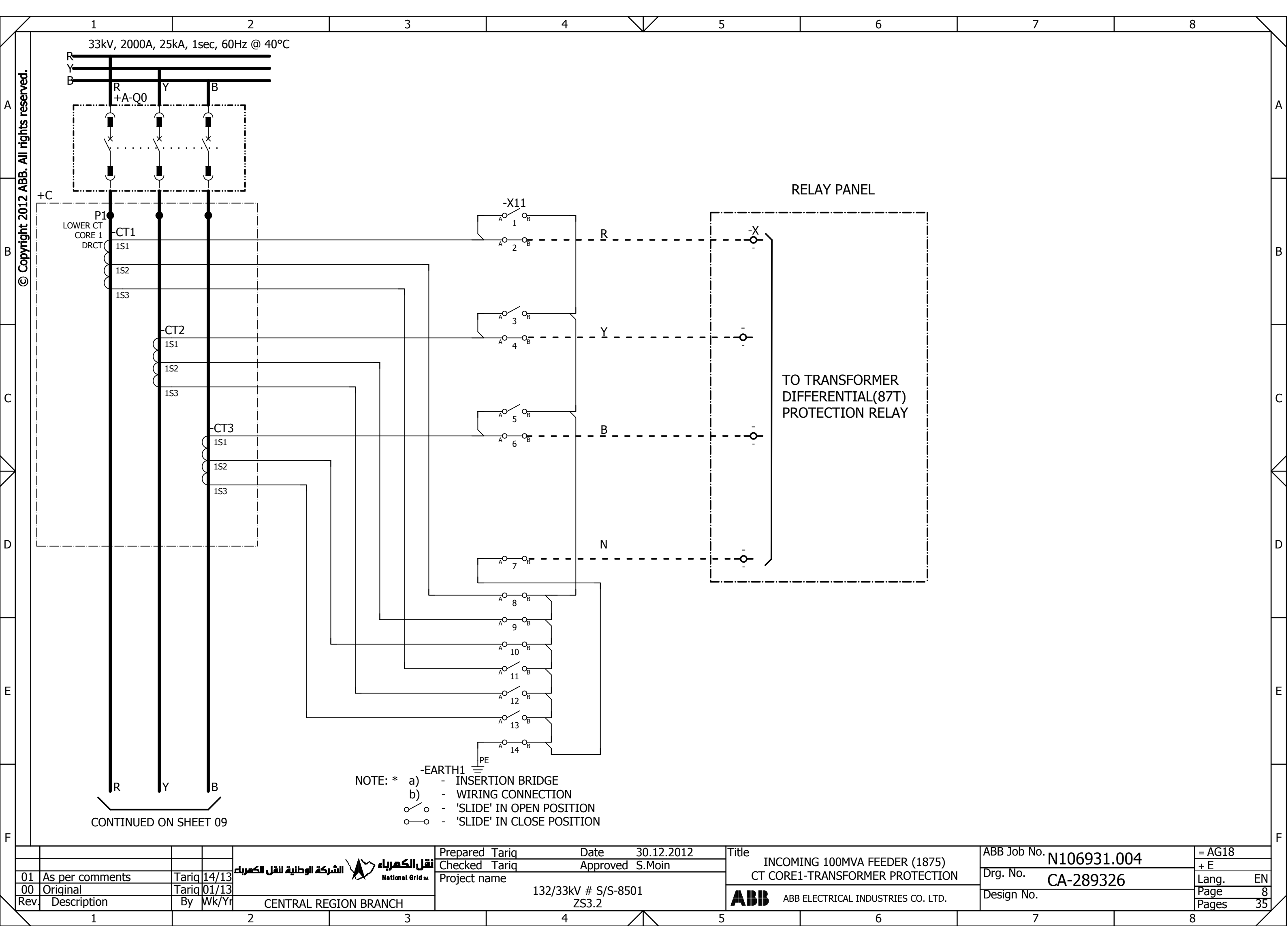
700 mm

1200 mm

Apparatus door +D



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01	As per comments	Tariq	14/13
00	Original	Tariq	01/13
Rev.	Description	By	Wk/Yr

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CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title

INCOMING 100MVA FEEDER (1875)
CT CORE1-TRANSFORMER PROTECTION


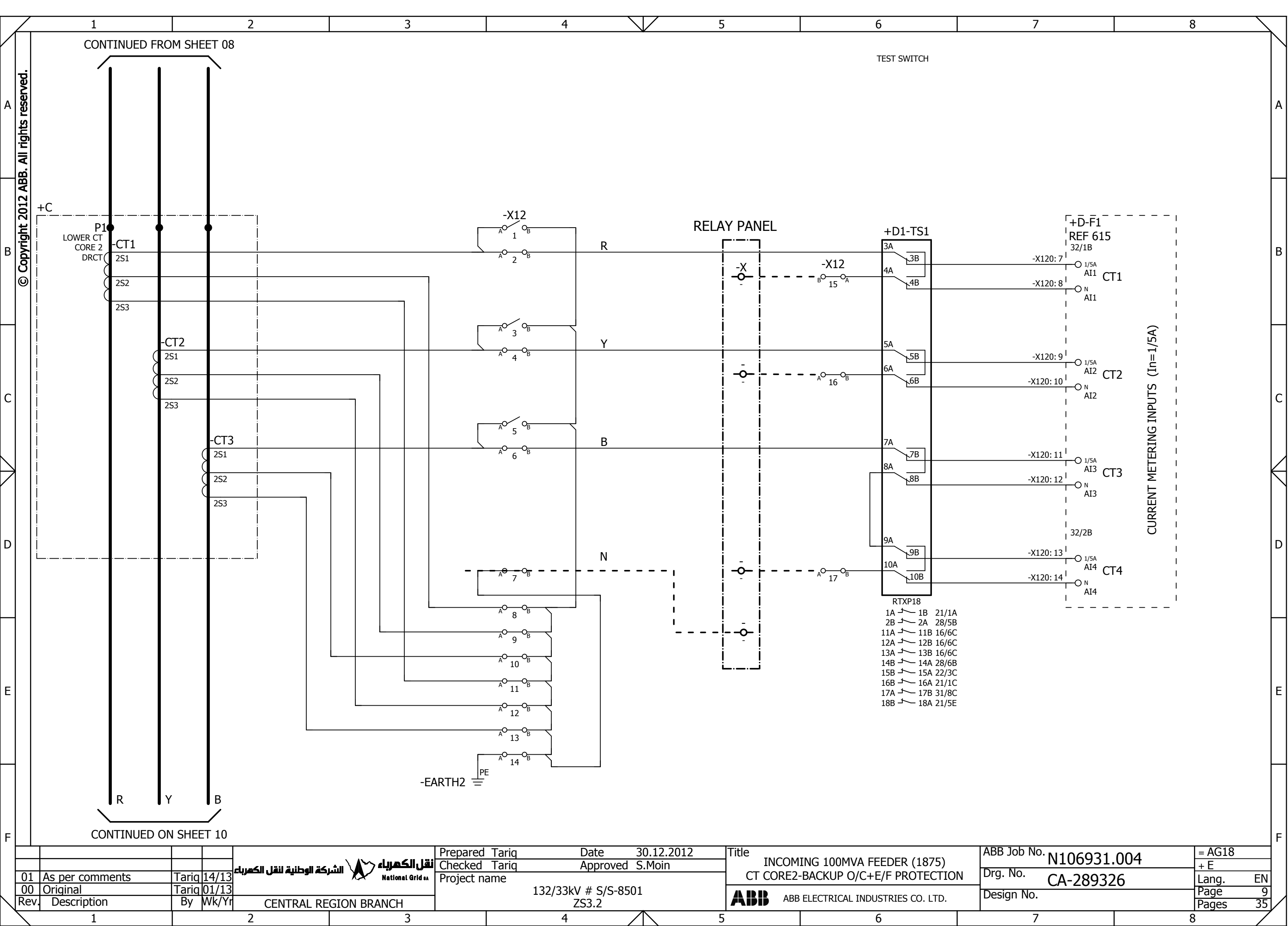
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ABB Job No.	N106931.004	= AG18
Drg. No.	CA-289326	+ E
Design No.		Lang. EN
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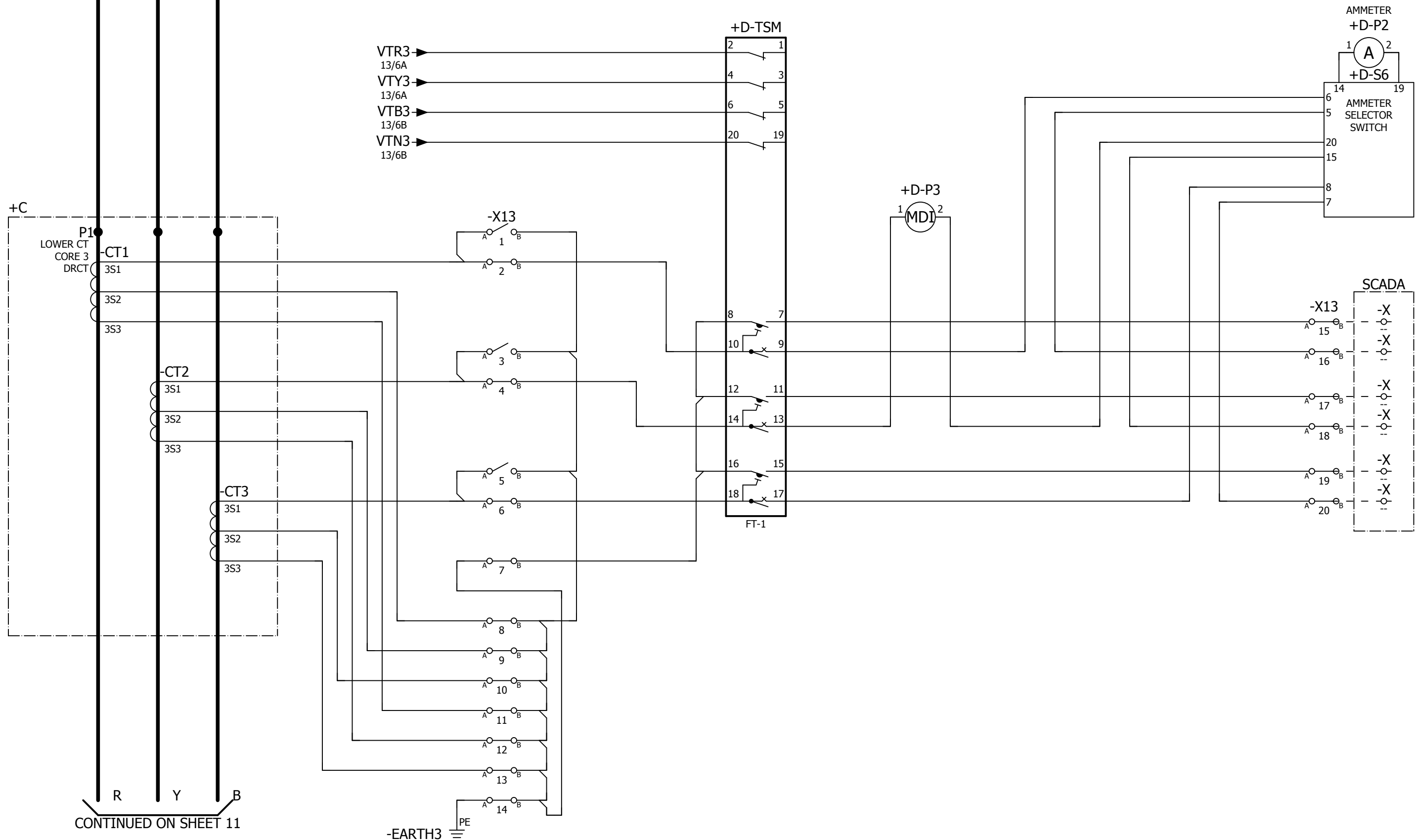
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00	Original	Tariq	01/13	
Rev.	Description	By	Wk/Yr	
				CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

Title	INCOMING 100MVA FEEDER (1875) CT CORE2-BACKUP O/C+E/F PROTECTION
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.


ABB Job No.	N106931.004	= AG18
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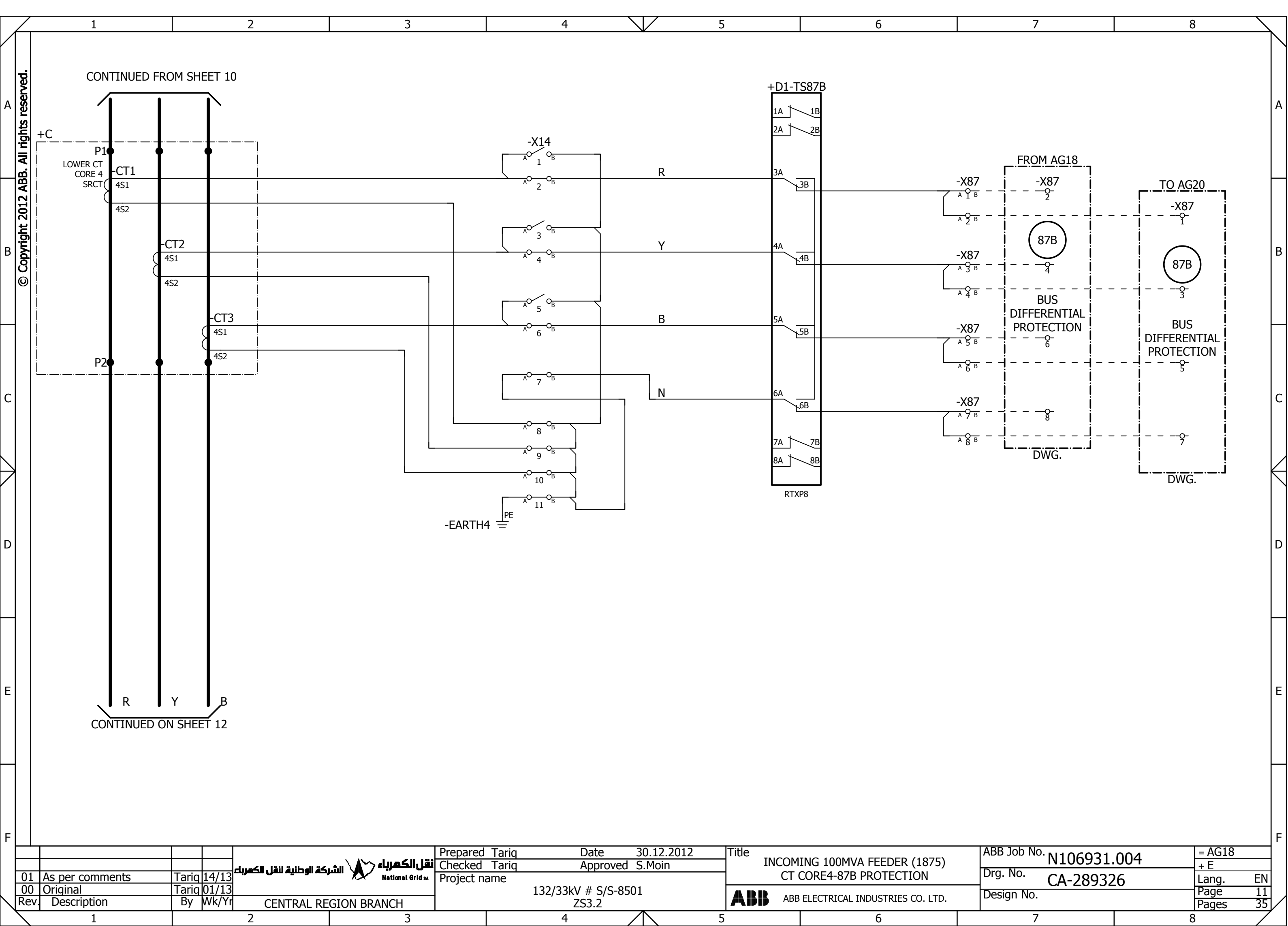
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title INCOMING 100MVA FEEDER (1875) CT CORE3-METERING	ABB Job No. N106931.004	= AG18	
					Checked Tariq	Approved S.Moin				+ E
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. CA-289326	Lang. EN
00	Original	Tariq	01/13							
Rev.	Description	By	Wk/Yr					Design No.	Page 10 Pages 35	



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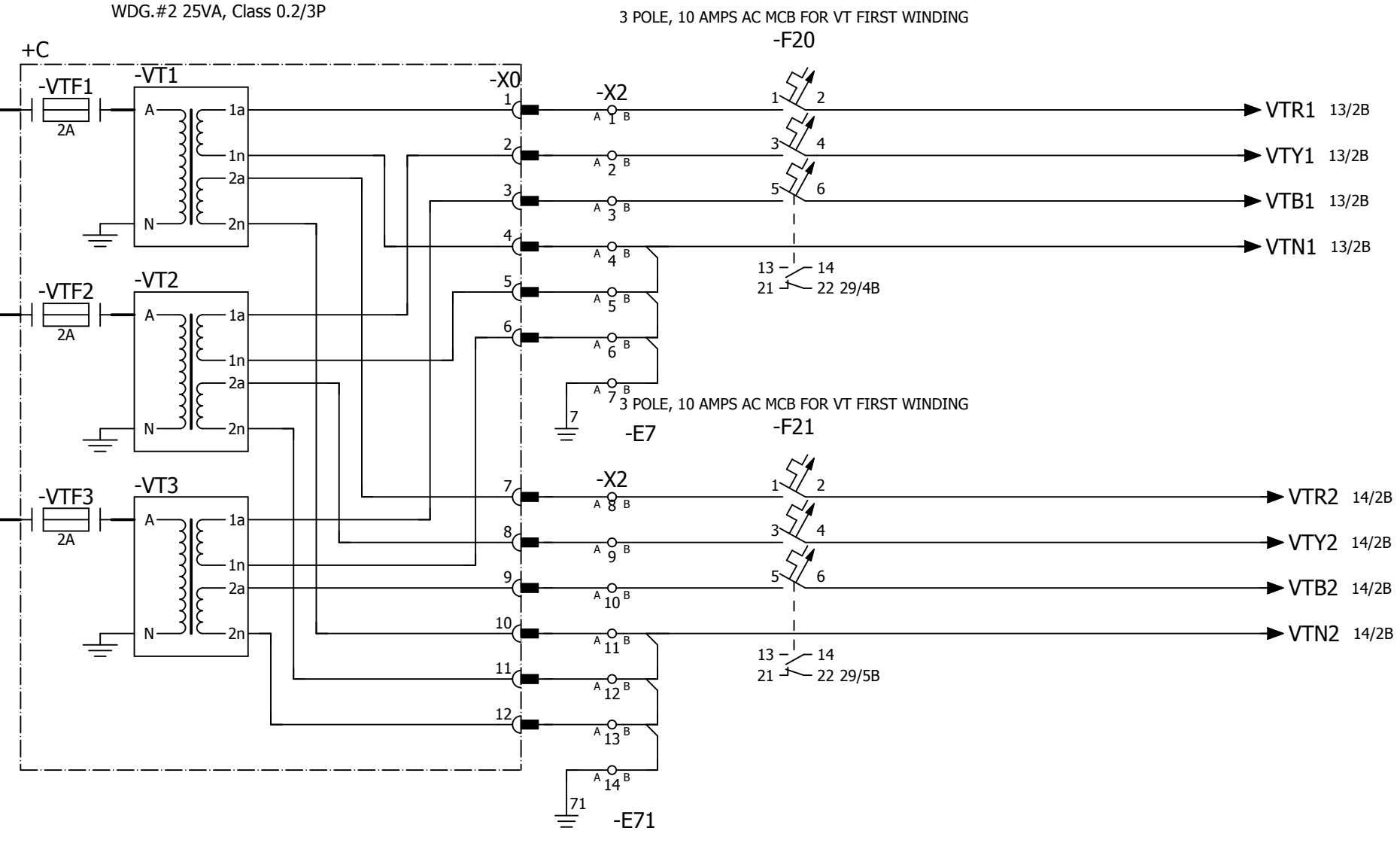
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					Checked Tariq	Approved S.Moin				+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2				Drg. No.	CA-289326
00	Original	Tariq	01/13							
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Pages 35

CONTINUED FROM SHEET 11

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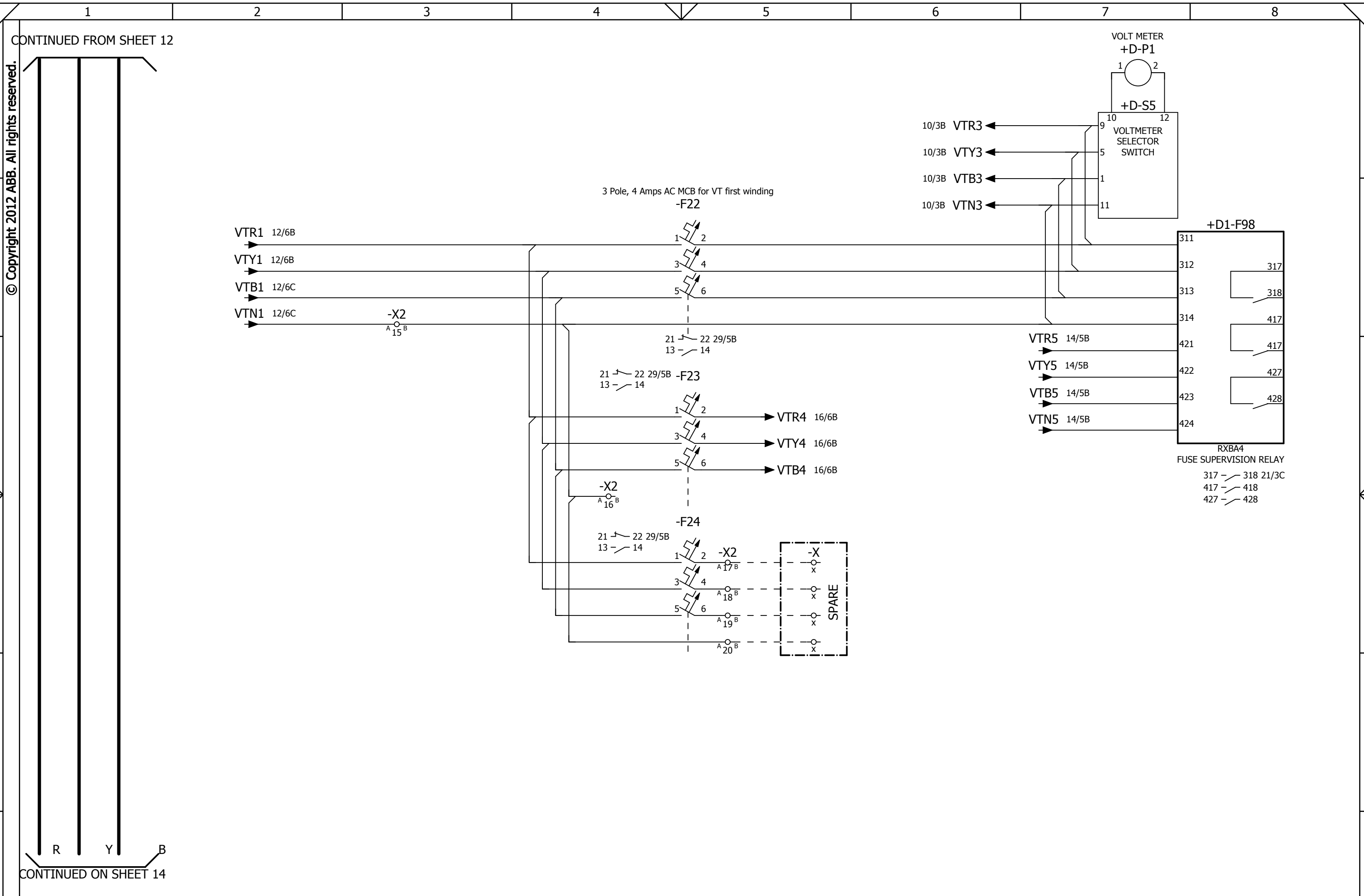
Withdrawable VT Truck in Cable Compartment

$\frac{33000}{1.732} \div \frac{110}{1.732} \div \frac{110}{1.732}$ VOLTS
WDG.#1 25VA, Class 0.2/3P
WDG.#2 25VA, Class 0.2/3P



CONTINUED ON SHEET 13

				Prepared Tariq		Date 30.12.2012	Title INCOMING 100MVA FEEDER (1875) VOLTAGE TRANSFORMER CIRCUIT ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	ABB Job No. N106931.004		= AG18
				Checked Tariq		Approved S.Moin		Drg. No. CA-289326		+ E
01 As per comments		Tariq 14/13		Project name		132/33kV # S/S-8501 ZS3.2				Lang. EN
00	Original	Tariq 01/13								Page 12
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1		2		3		4	5	6	7	8



				Prepared Tariq	Date 30.12.2012	Title	ABB Job No.	= AG18
				Checked Tariq	Approved S.Moin	INCOMING 100MVA FEEDER (1875)	N106931.004	+ E
				Project name		VOLTAGE TRANSFORMER CIRCUIT	Drg. No.	Lang. EN
					132/33kV # S/S-8501	ABB	CA-289326	Page 13
					ZS3.2	ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Pages 35
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01As per commentsTariq14/13

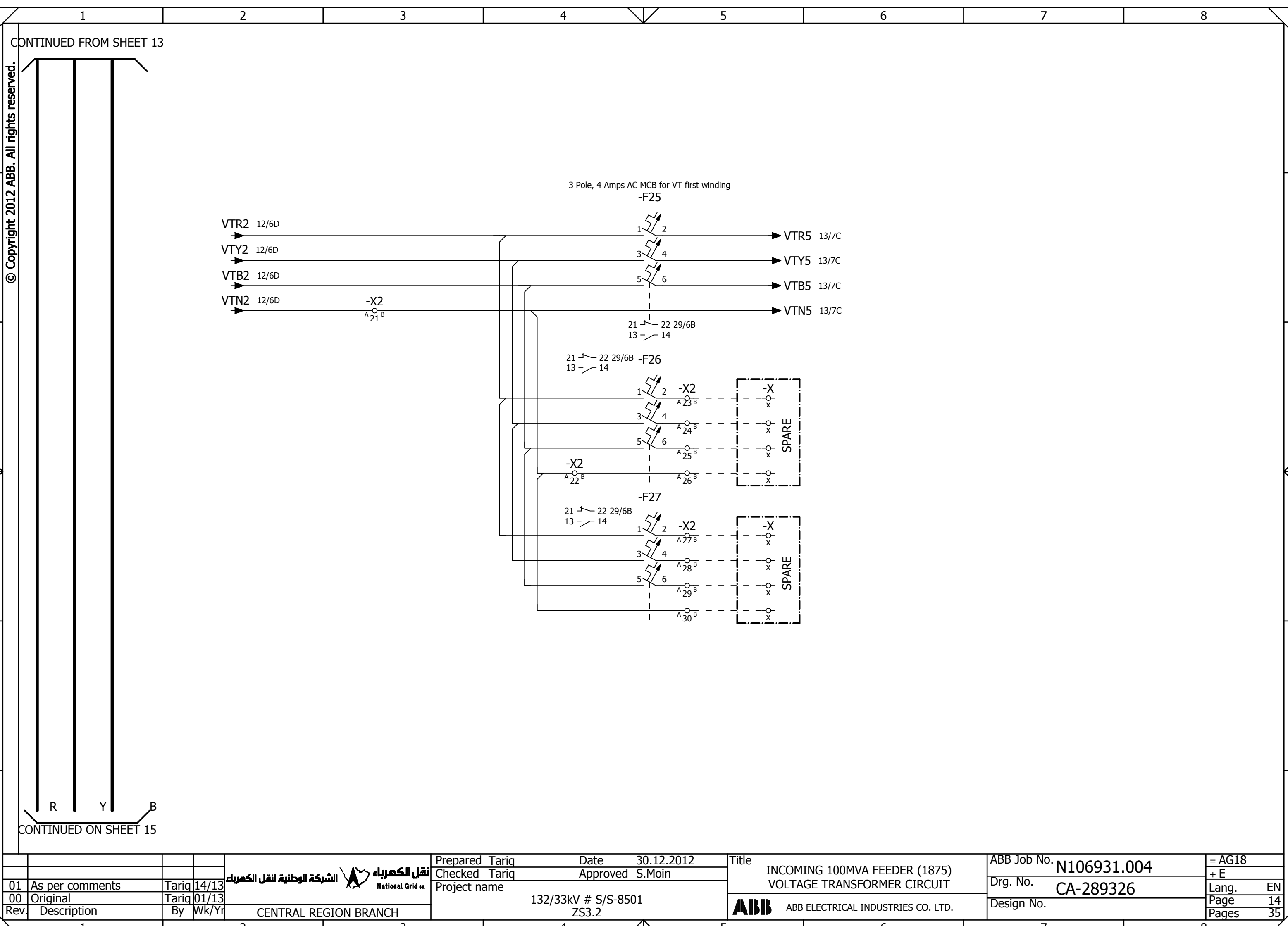
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National Grid sa

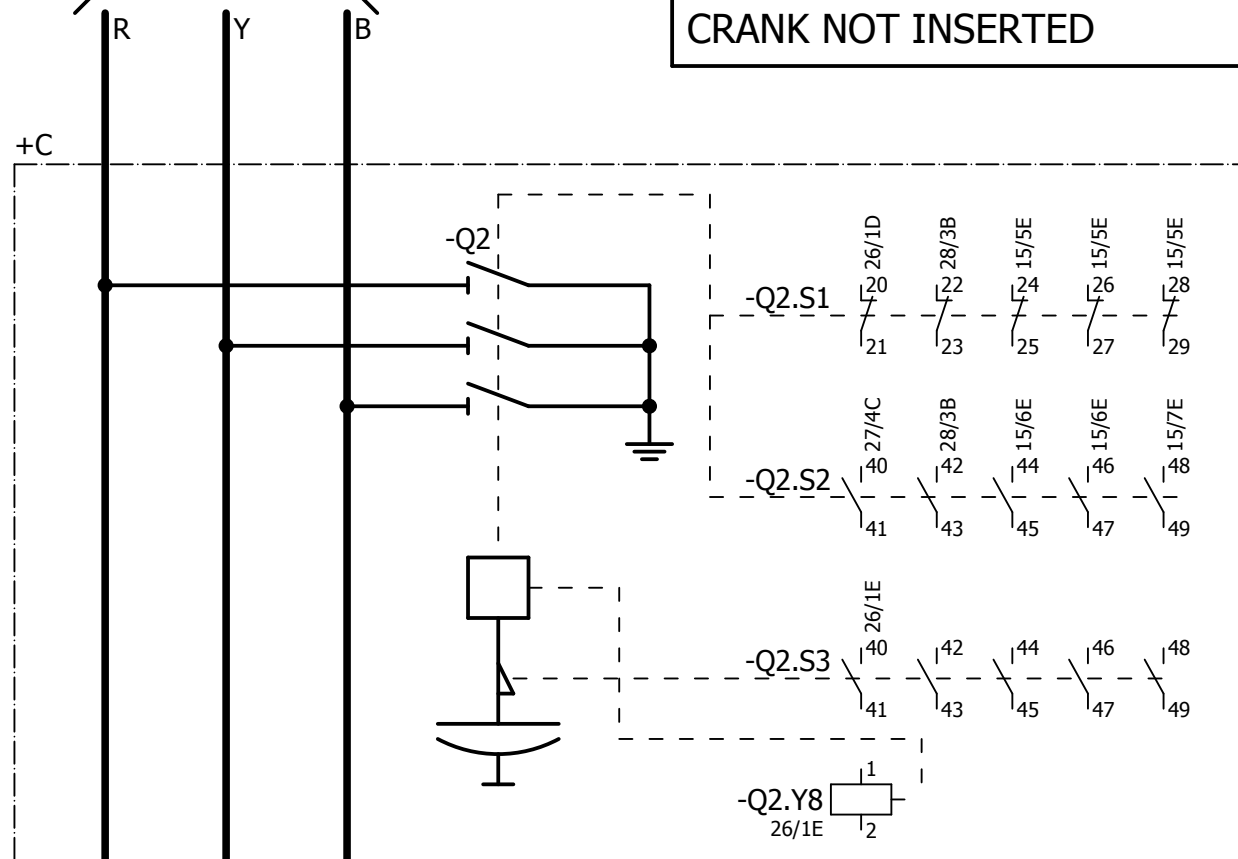
CENTRAL REGION BRANCH



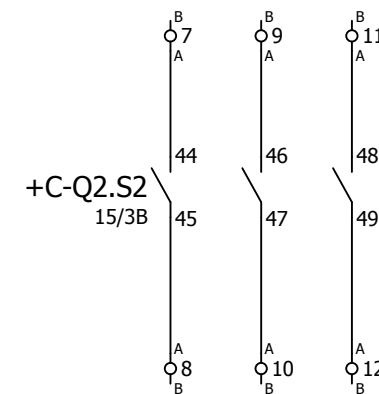
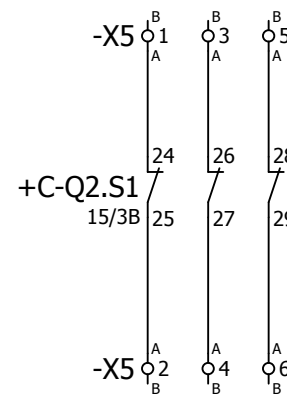
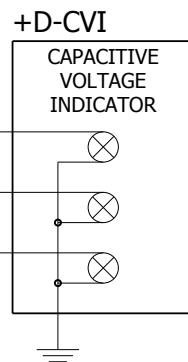
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				Checked Tariq	Approved S.Moin	INCOMING 100MVA FEEDER (1875) VOLTAGE TRANSFORMER CIRCUIT	Drg. No. CA-289326	+ E
01	As per comments	Tariq	14/13	Project name 132/33kV # S/S-8501 ZS3.2		ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.	Lang. EN
00	Original	Tariq	01/13					Page 14
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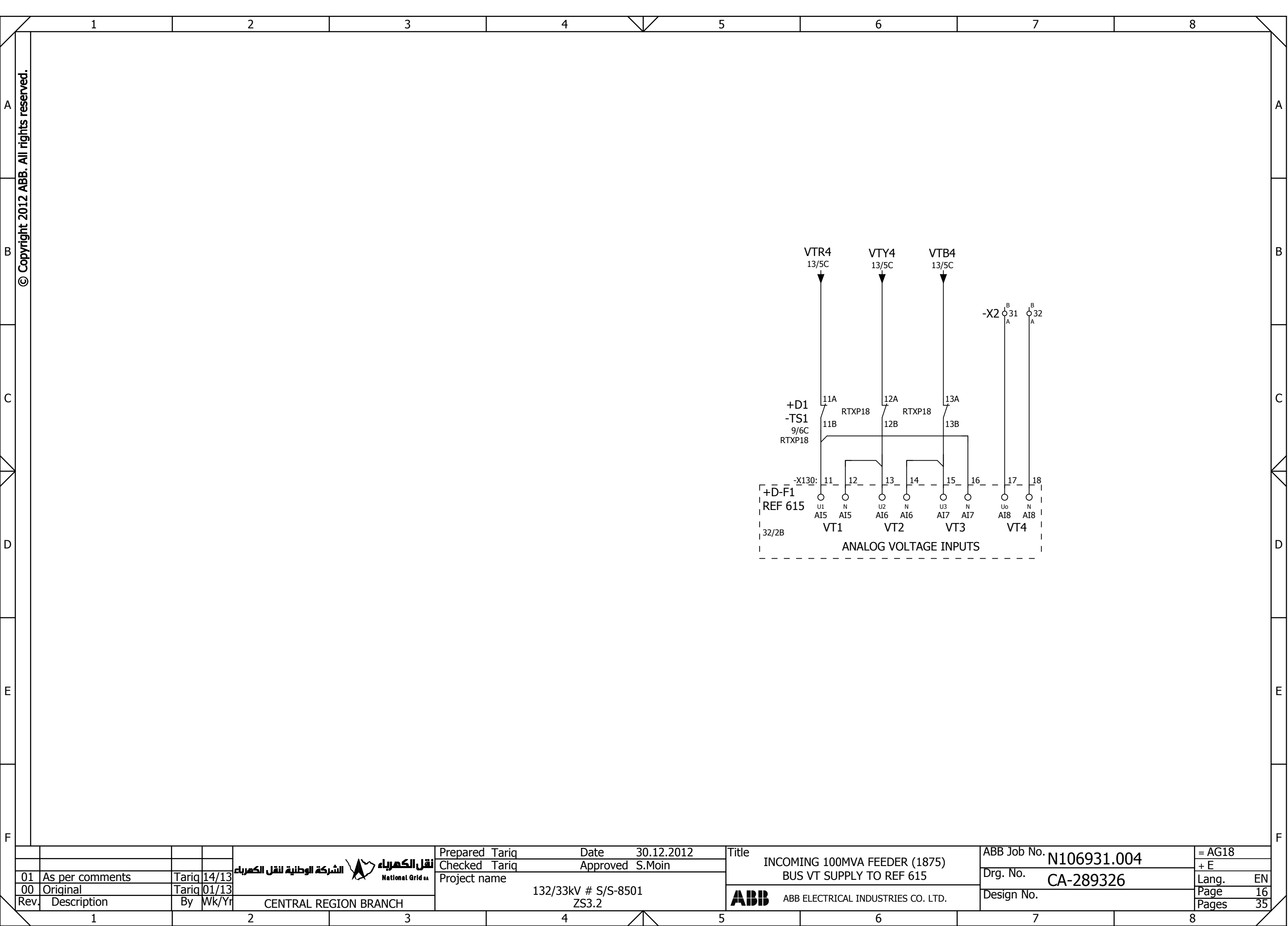
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EARTHING SWITCH OFF AND
CRANK NOT INSERTED

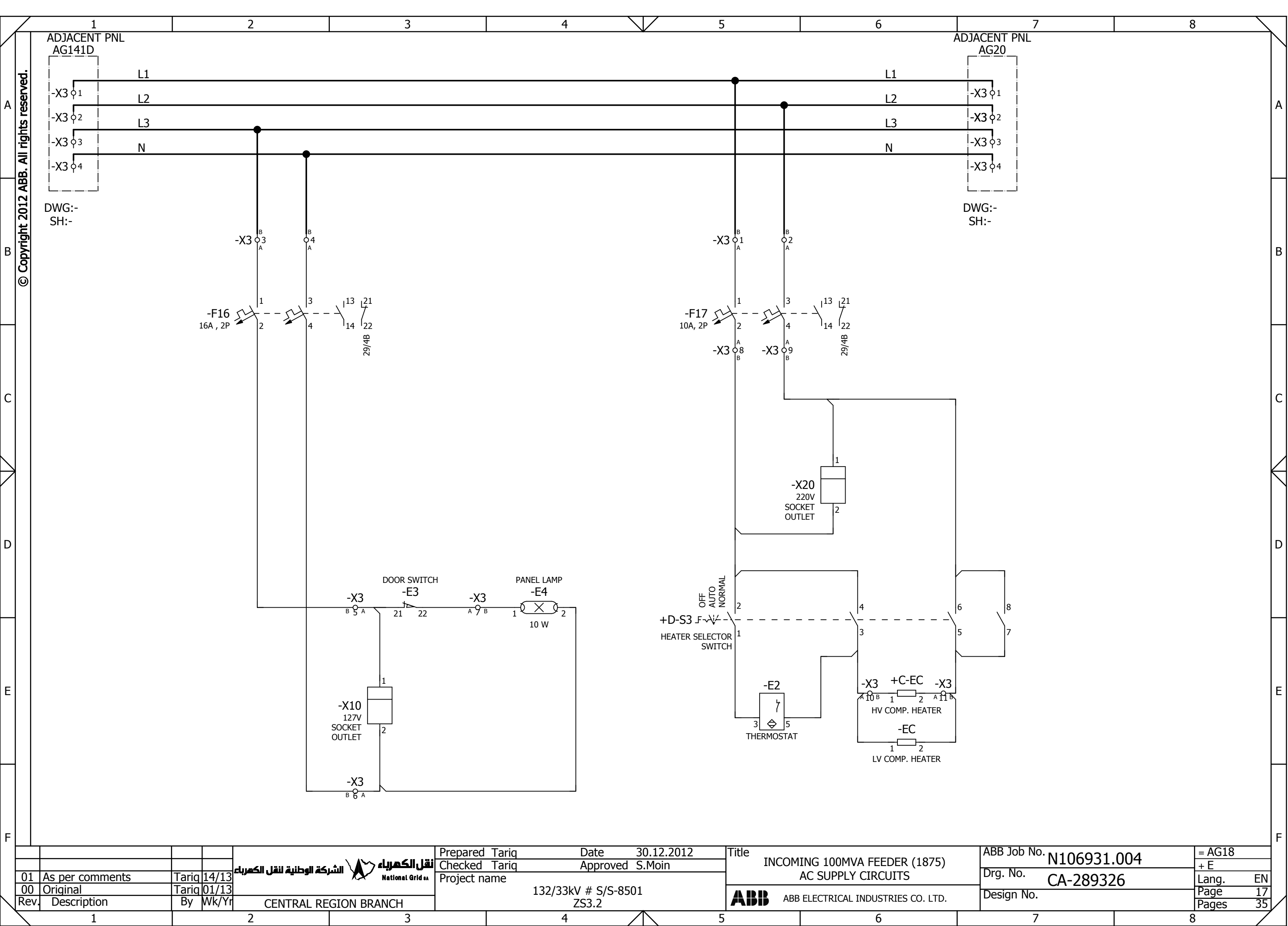


DESIGNATION	DESCRIPTION
-Q2.S1	EARTHING SWITCH OFF AND CRANK NOT INSERTED
-Q2.S2	EARTHING SWITCH ON
-Q2.S3	CRANK INSERTED
-Q2.Y8	EARTHING SWITCH BLOCKING COIL





				<div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title INCOMING 100MVA FEEDER (1875) BUS VT SUPPLY TO REF 615	ABB Job No. N106931.004	= AG18	
					Checked Tariq	Approved S.Moin			+ E	
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Drg. No. CA-289326	Lang. EN	
00	Original	Tariq	01/13					Design No.		Page 16
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>
01	As per comments	Tariq	14/13	
00	Original	Tariq	01/13	
Rev.	Description	By	Wk/Yr	
1		2	3	CENTRAL REGION BRANCH

Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name 132/33kV # S/S-8501 ZS3.2	

Title	INCOMING 100MVA FEEDER (1875) AC SUPPLY CIRCUITS
ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG18
Drg. No.	CA-289326	+ E
Design No.		Lang. EN
		Page 17
		Pages 35

F

A

B

C

D

E

F

A

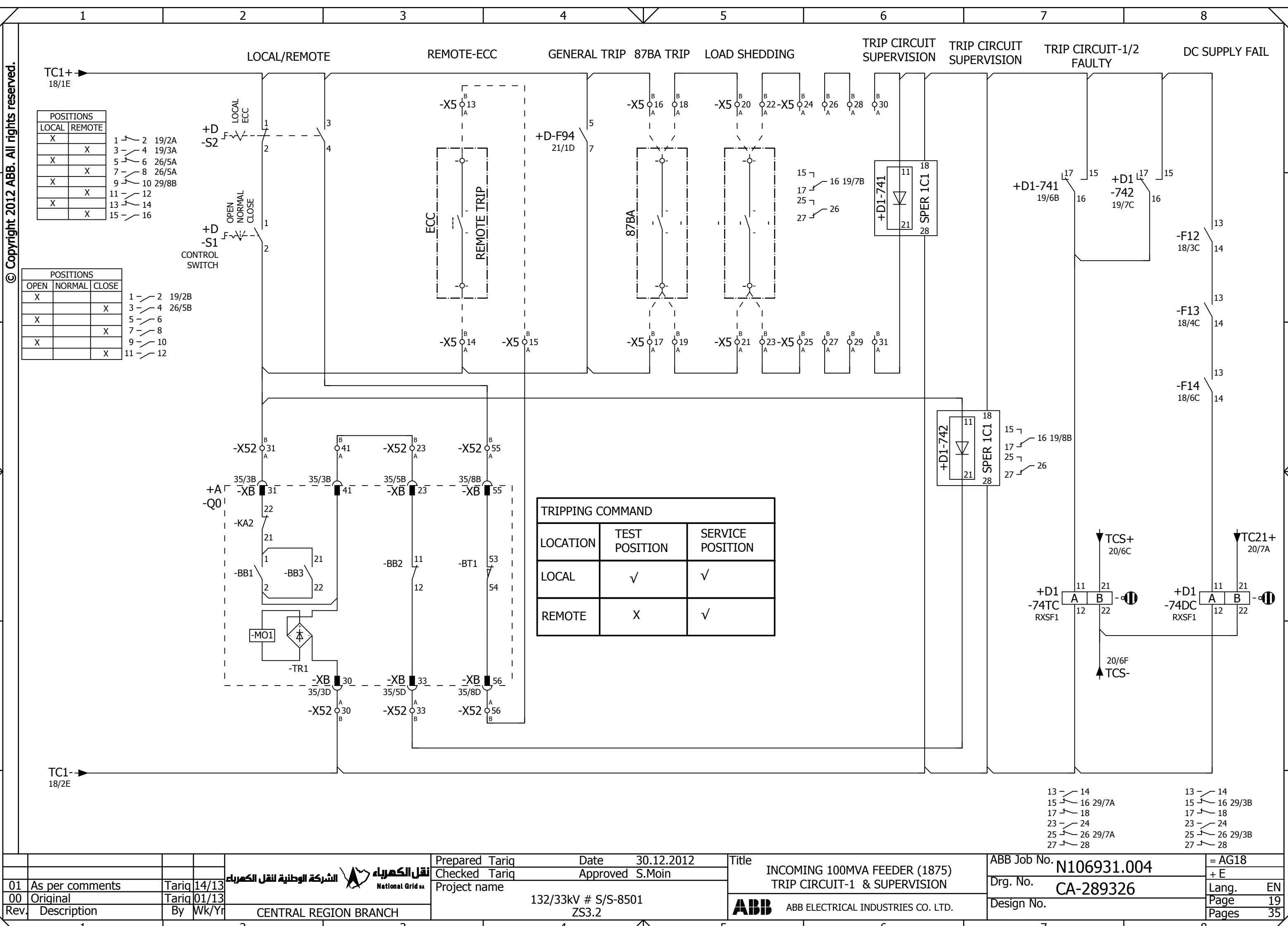
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C

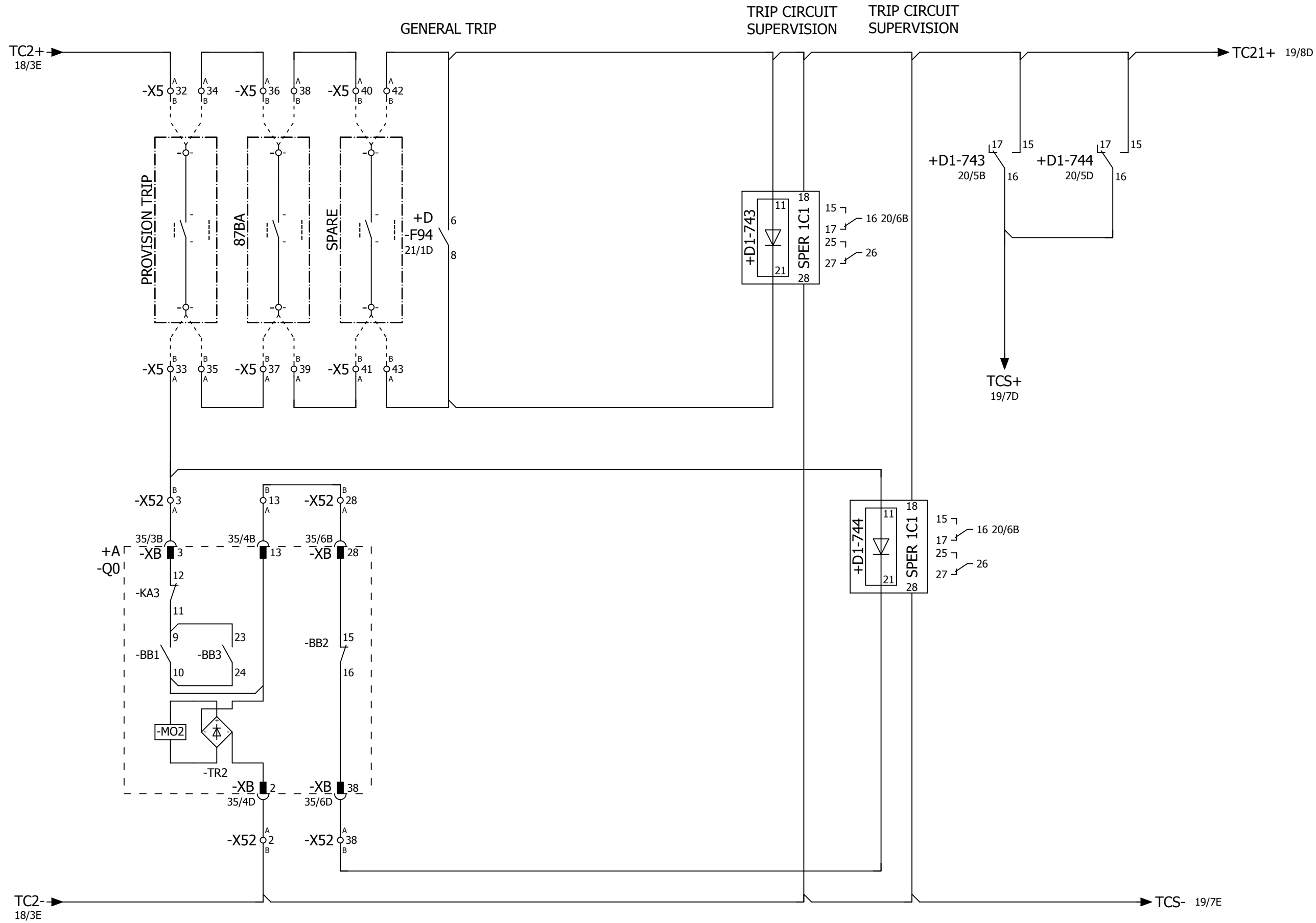
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00	Original	Tariq	01/13			132/33kV # S/S-8501	 ABB ELECTRICAL INDUSTRIES CO. LTD.	Design No.		Page 19	
Rev.	Description	By	Wk/Yr		CENTRAL REGION BRANCH	ZS3.2				Pages 35	



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Rev.	Description	By	Wk/Yr

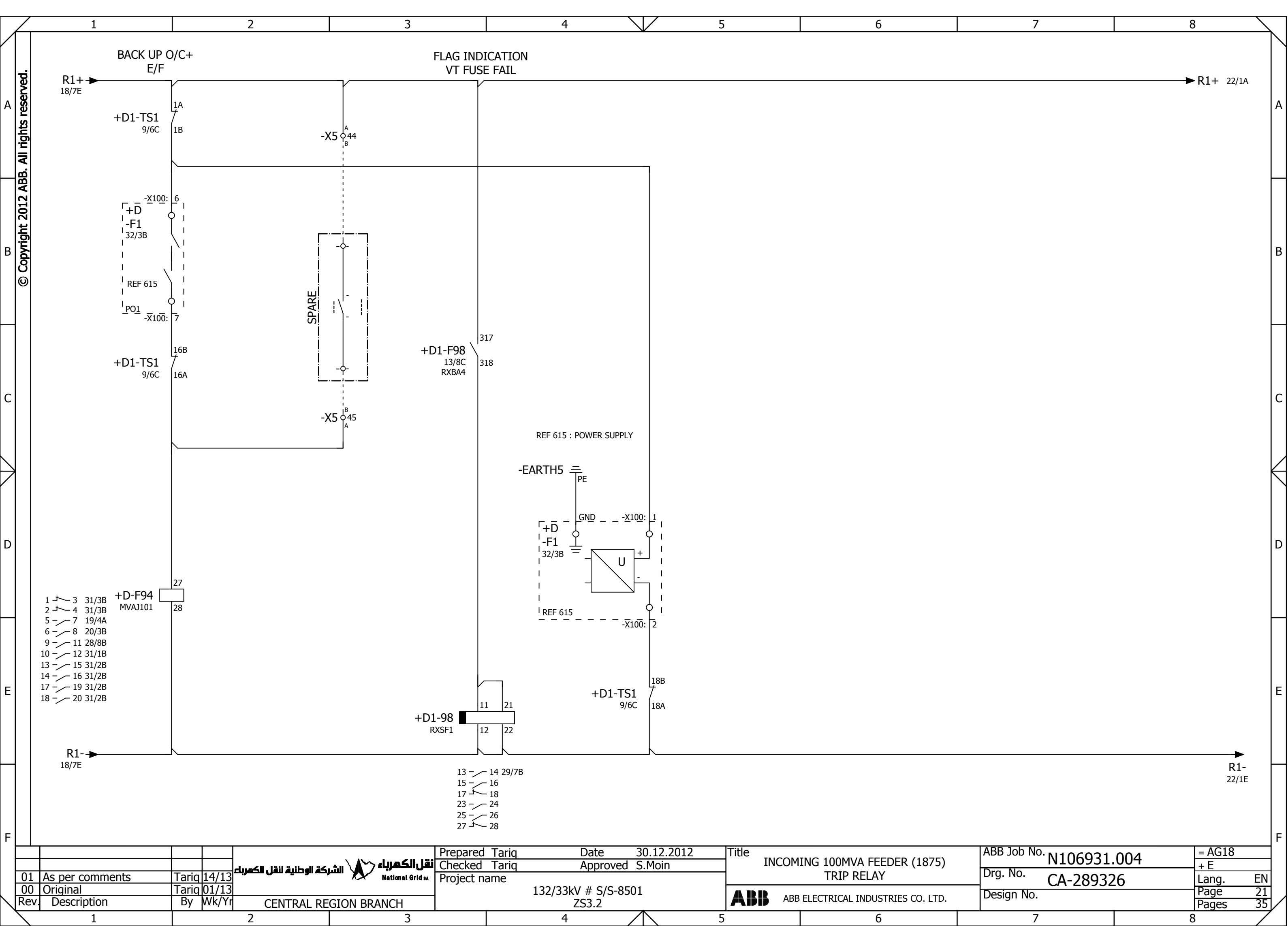
الشركة الوطنية لنقل الكهرباء
National Grid sa

CENTRAL REGION BRANCH


Prepared Tariq	Date 30.12.2012
Checked Tariq	Approved S.Moin
Project name	132/33kV # S/S-8501 ZS3.2

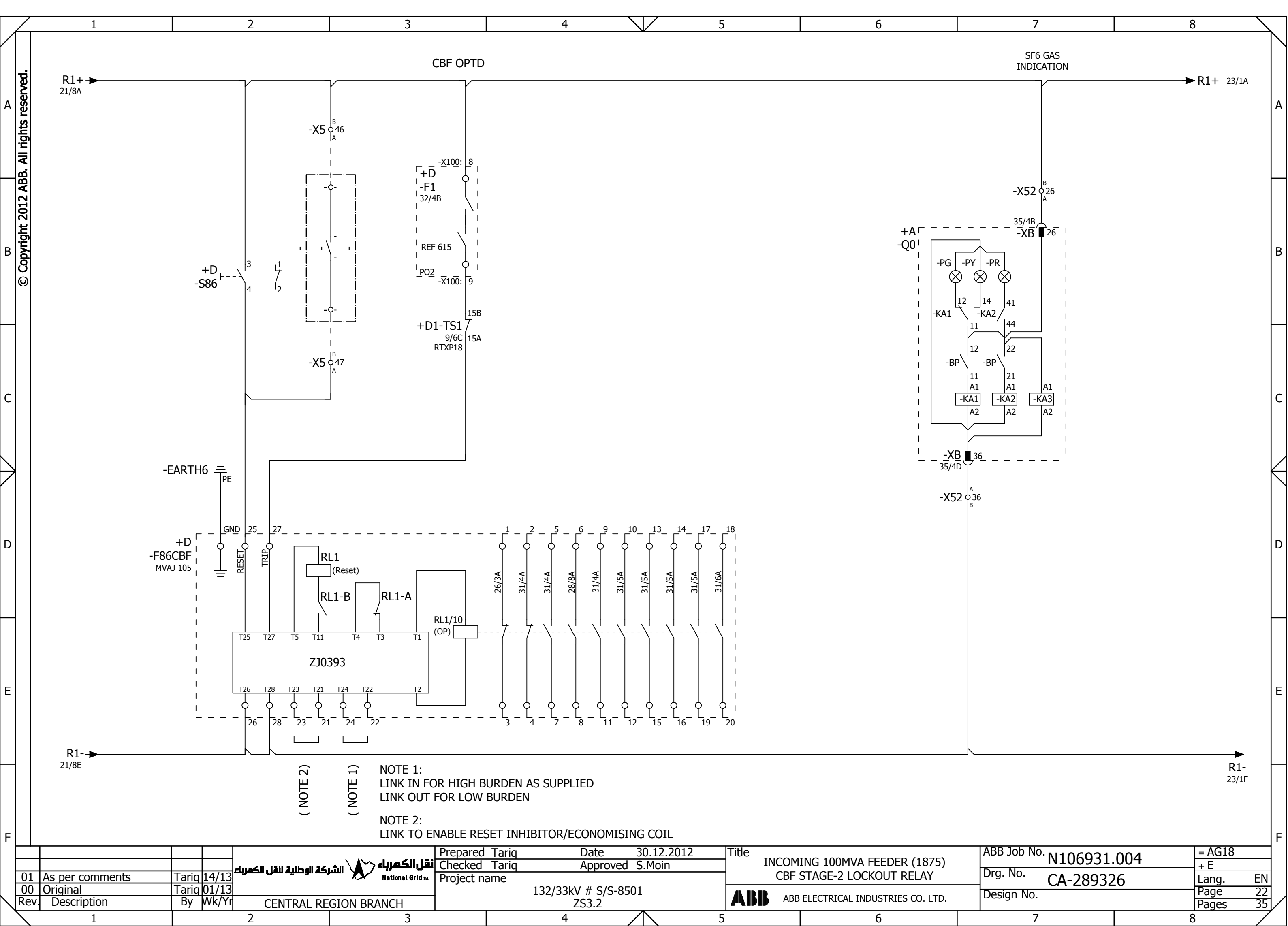
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ABB	ABB ELECTRICAL INDUSTRIES CO. LTD.

ABB Job No.	N106931.004	= AG18
Drg. No.	CA-289326	+ E
Design No.		Lang. EN
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title INCOMING 100MVA FEEDER (1875) TRIP RELAY	ABB Job No. N106931.004	= AG18
					Checked Tariq	Approved S.Moin			+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Drg. No. CA-289326	Lang. EN
00	Original	Tariq	01/13					Design No.	Page 21
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>
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Rev.	Description	By	Wk/Yr	

CENTRAL REGION BRANCH

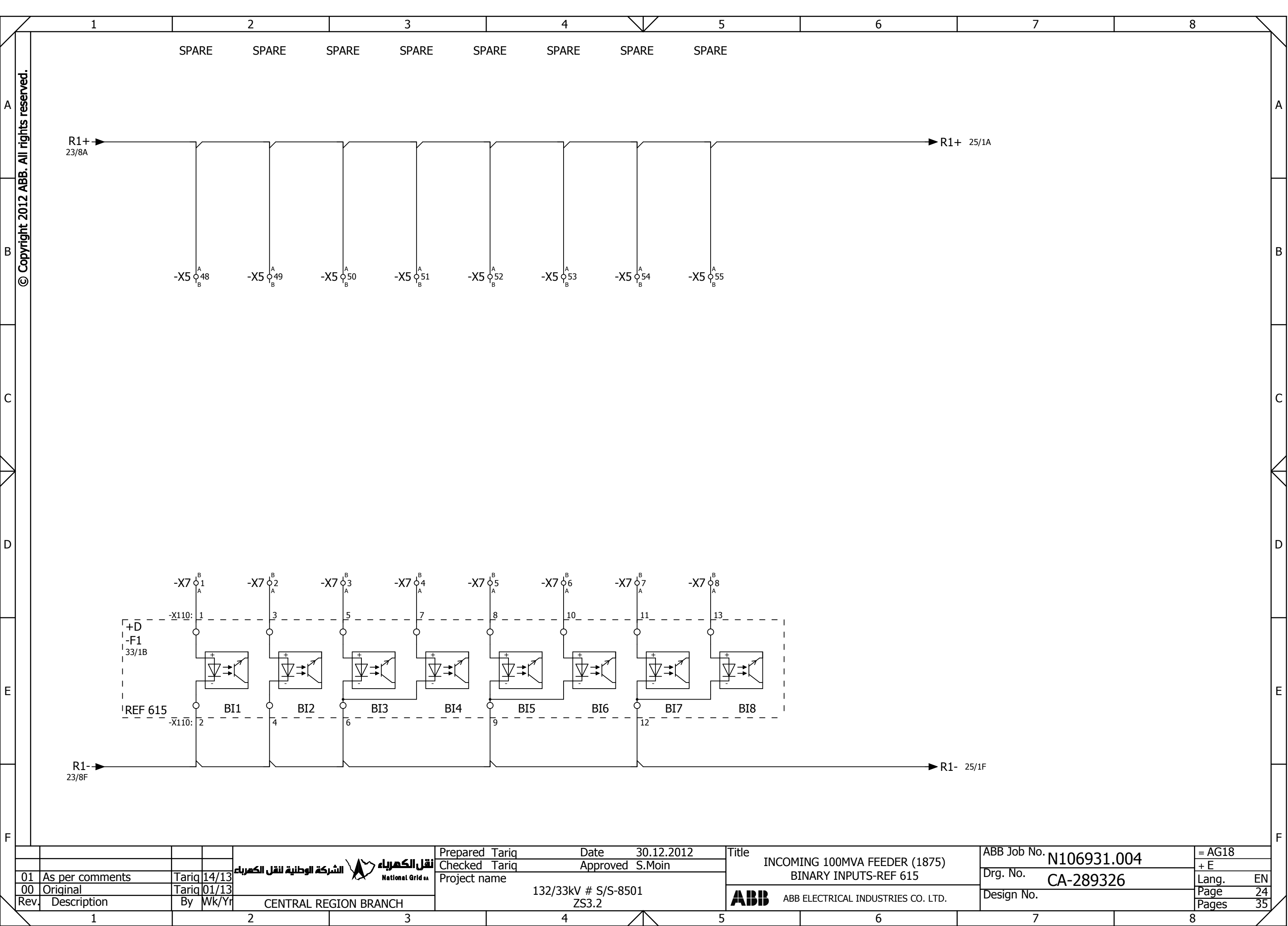
Prepared	Tarig	Date	30.12.2012
Checked	Tarig	Approved	S.Moin
Project name		132/33kV # S/S-8501 ZS3.2	

Title	INCOMING 100MVA FEEDER (1875) CBF STAGE-2 LOCKOUT RELAY
	ABB ELECTRICAL INDUSTRIES CO. LTD.

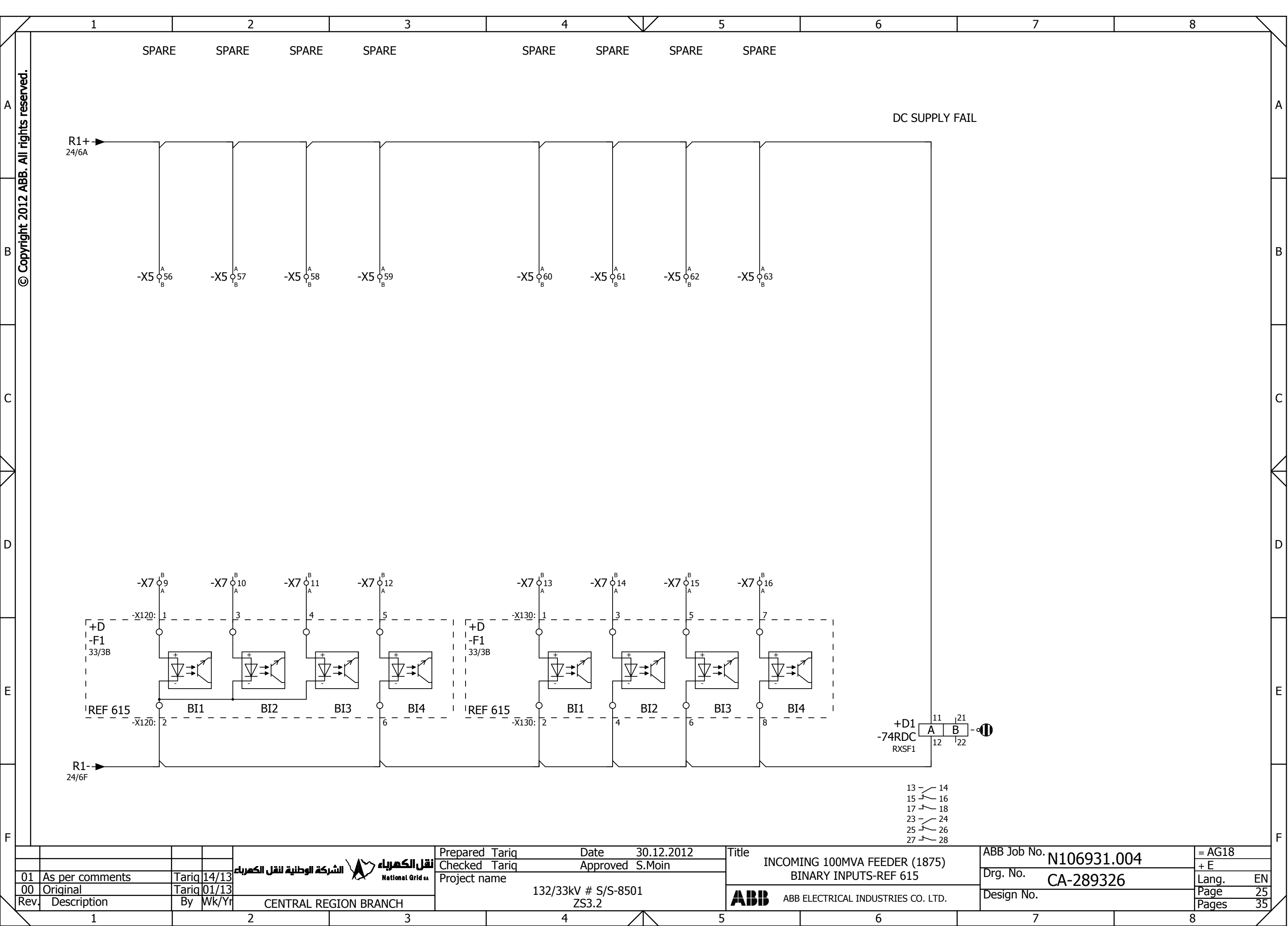
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Drg. No.	CA-289326	+ E
Design No.		Lang. EN
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		Pages 35



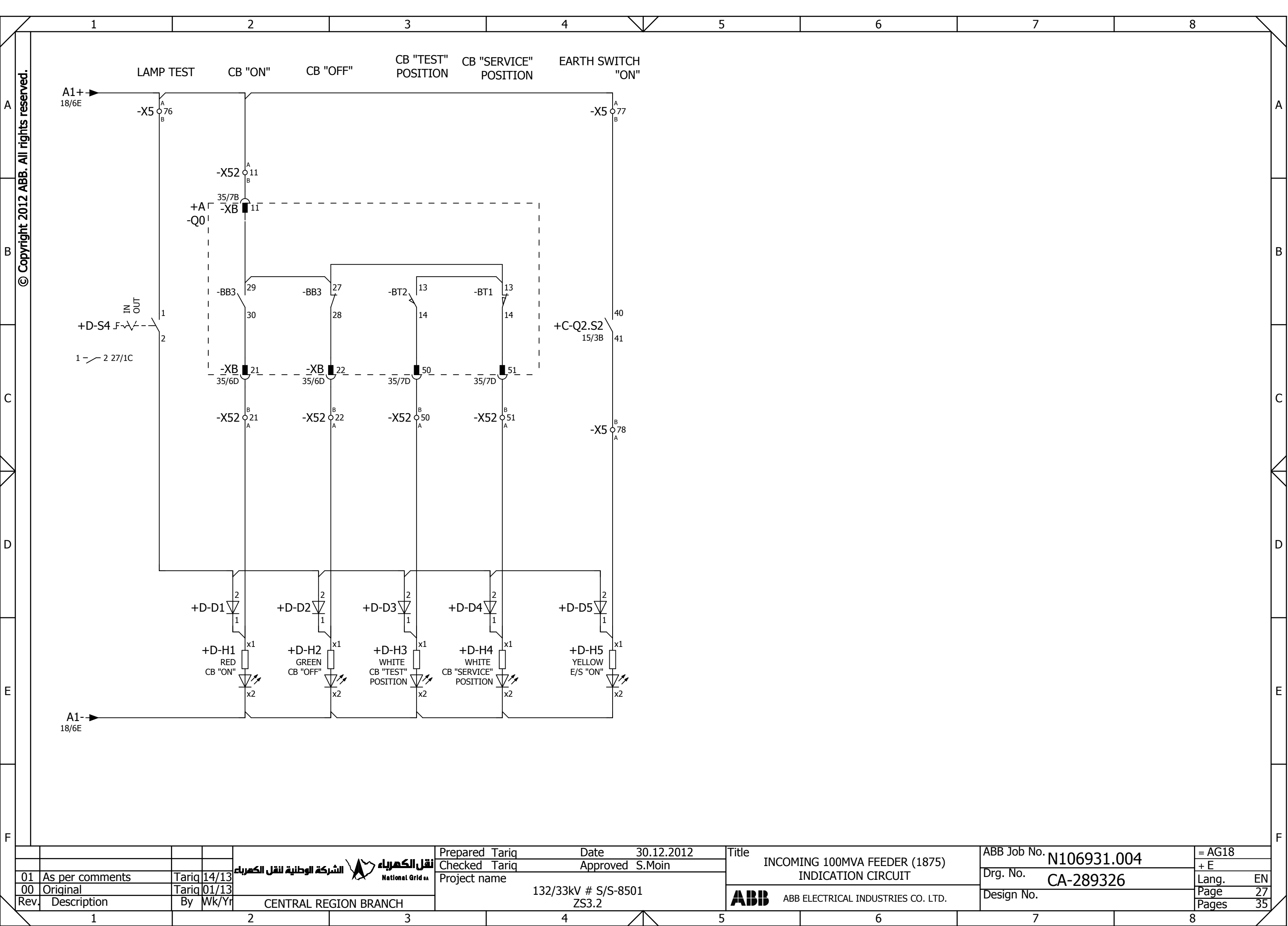
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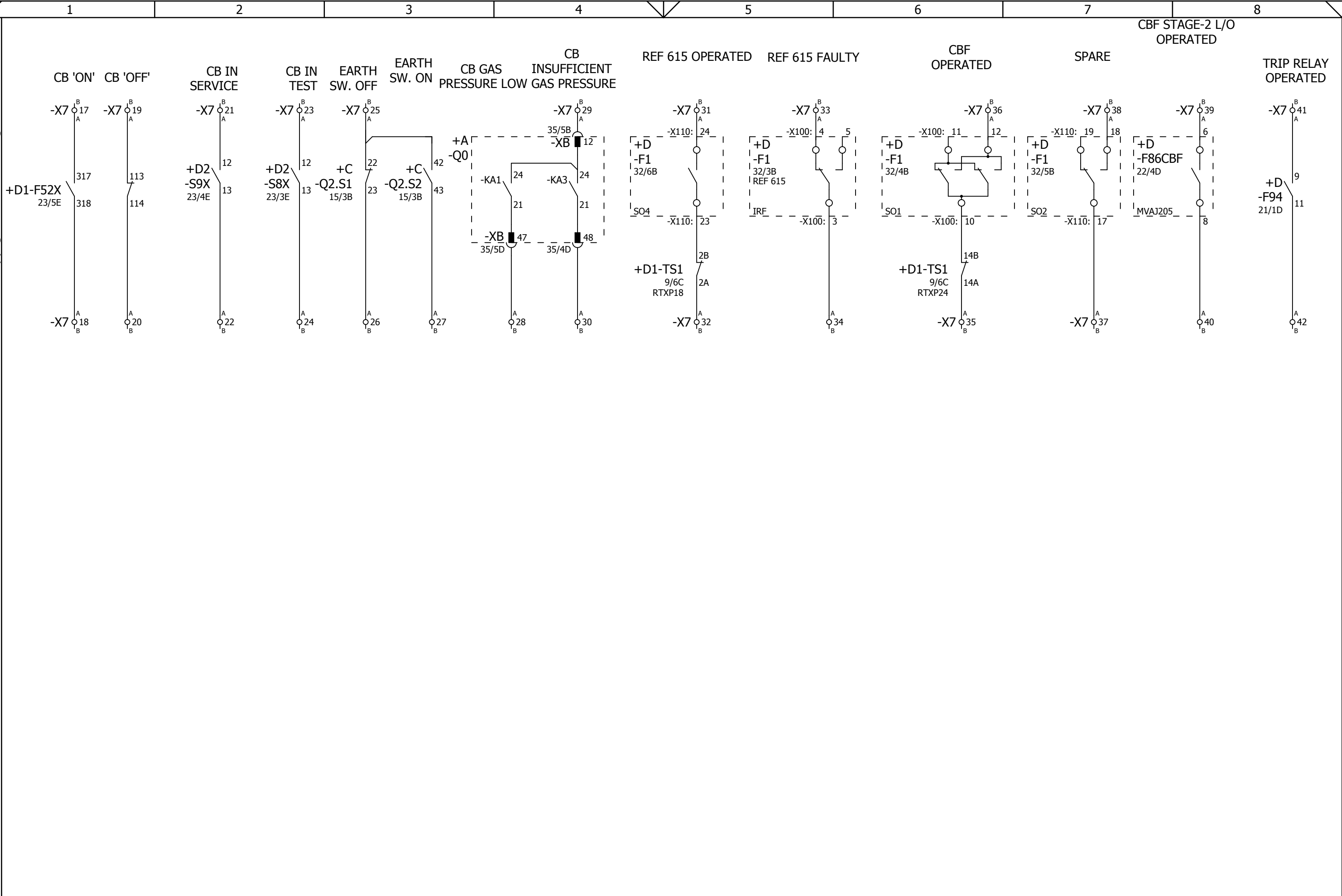




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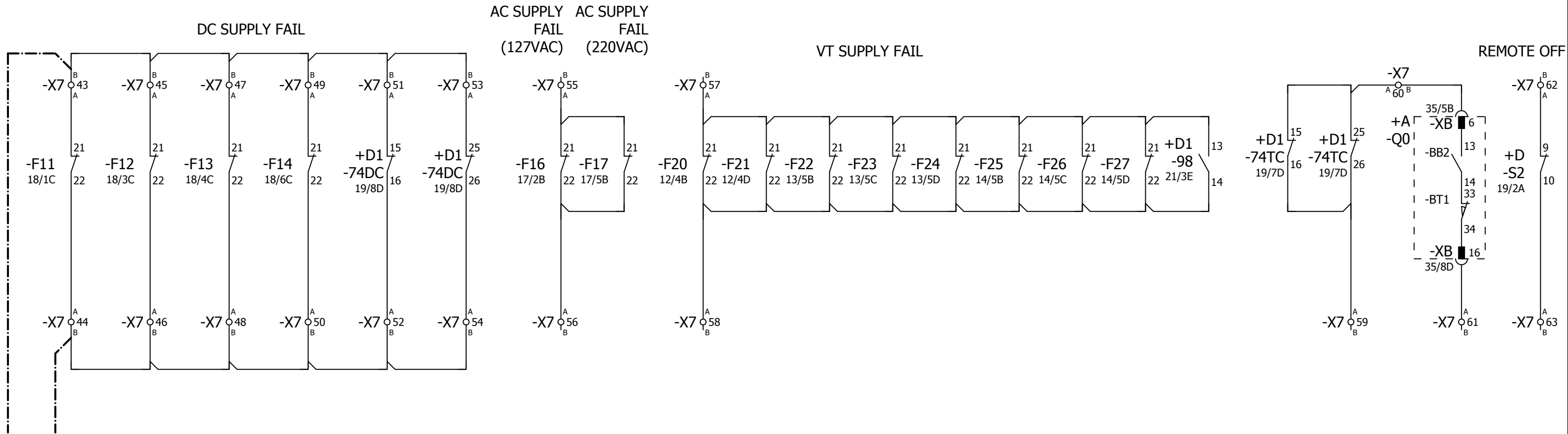
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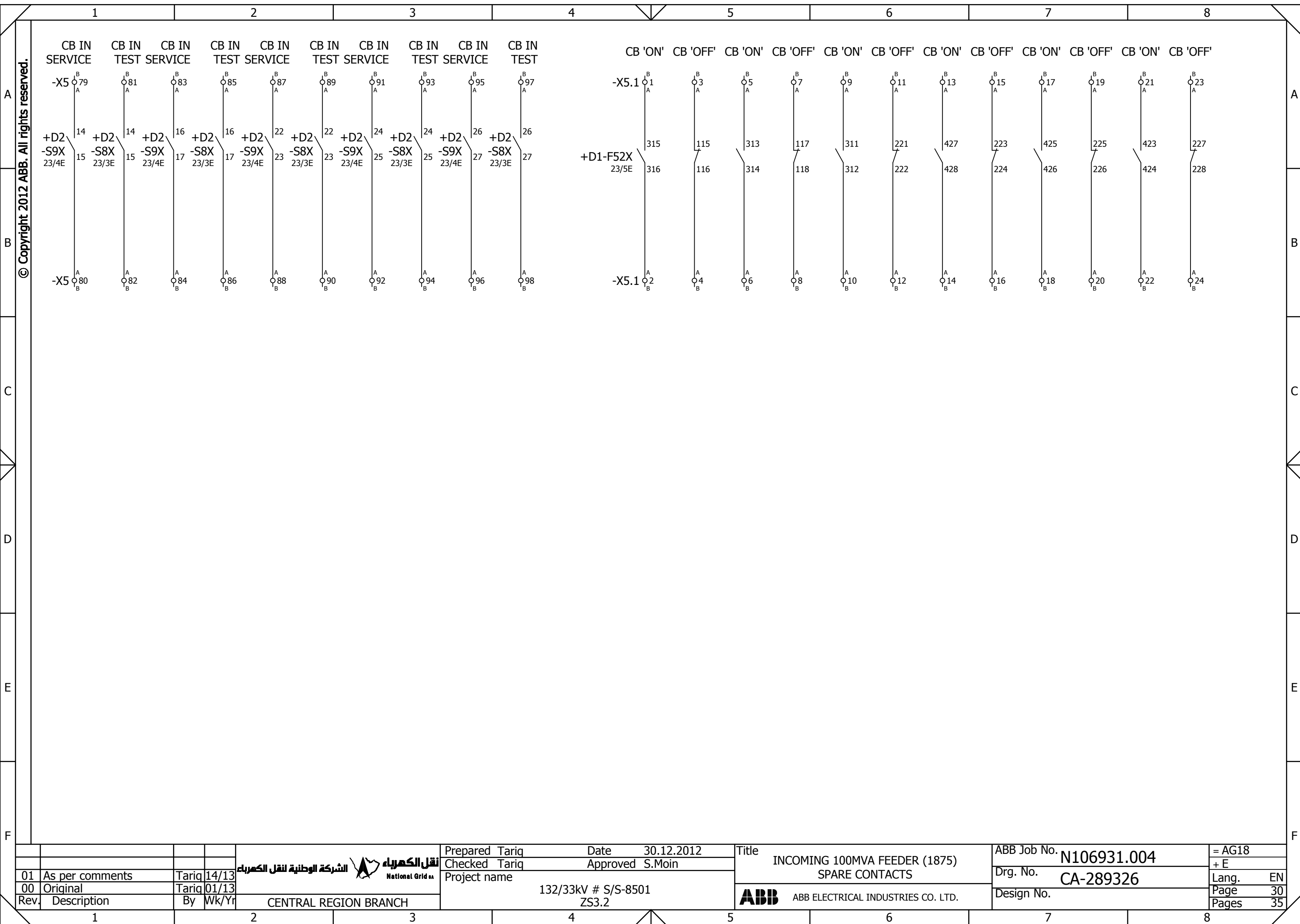


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					Checked Tariq	Approved S.Moin			Drg. No. CA-289326	+ E
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2		<div> ABB ELECTRICAL INDUSTRIES CO. LTD.</div>	Design No.	Lang. EN
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				<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div>	Prepared Tariq	Date 30.12.2012	Title INCOMING 100MVA FEEDER (1875) CONTACTS TO SCADA ALARM	ABB Job No. N106931.004	= AG18
					Checked Tariq	Approved S.Moin			+ E
01	As per comments	Tariq	14/13		Project name 132/33kV # S/S-8501 ZS3.2			Drg. No. CA-289326	Lang. EN
00	Original	Tariq	01/13					Design No.	Page 29
Rev.	Description	By	Wk/Yr	CENTRAL REGION BRANCH			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.		Pages 35



1



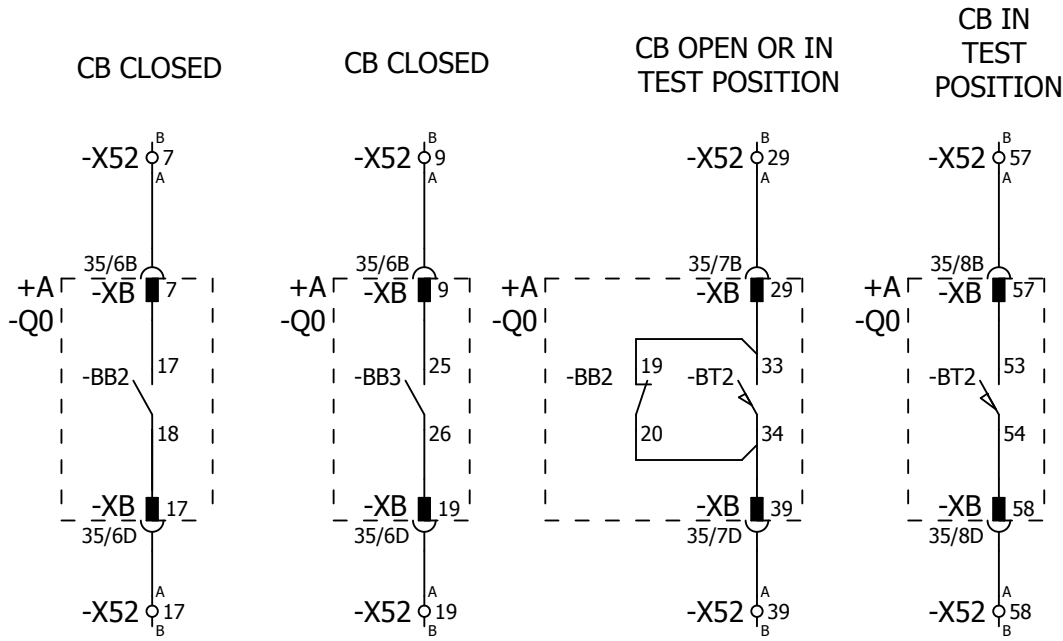
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REF 615 : BACK UP O/C +E/F RELAY



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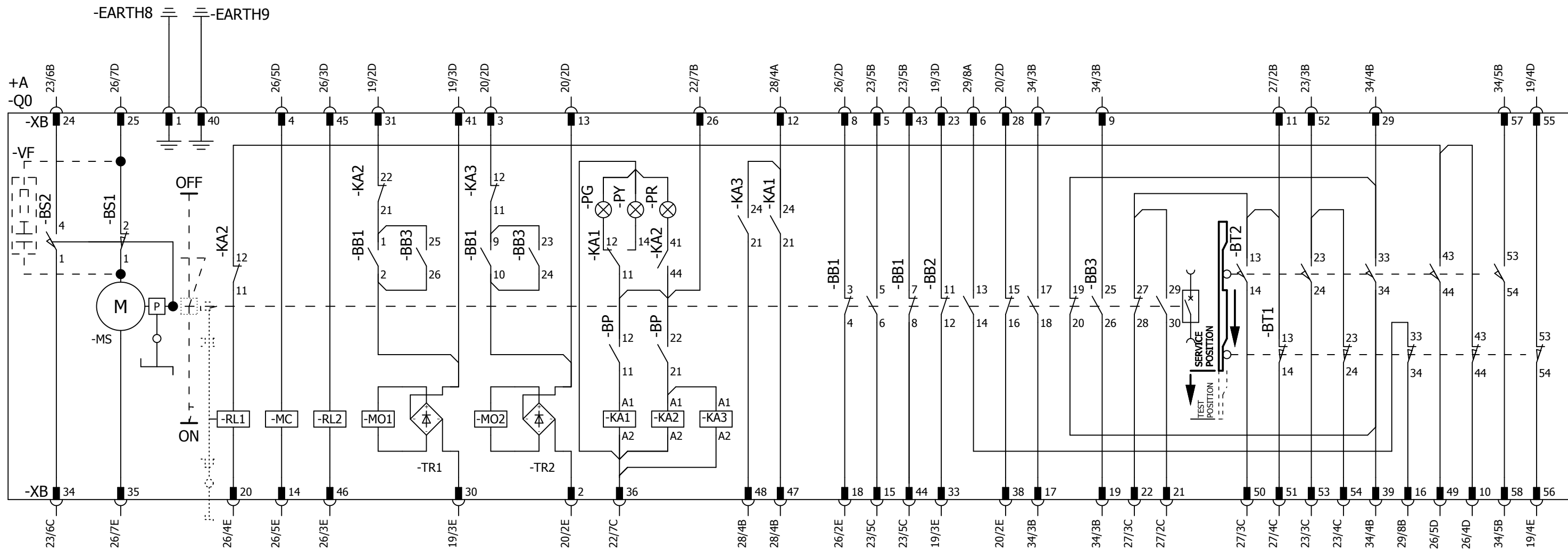
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					Checked Tariq	Approved S.Moin				+ E	
01	As per comments	Tariq	14/13		CENTRAL REGION BRANCH	Project name 132/33kV # S/S-8501 ZS3.2			ABB ABB ELECTRICAL INDUSTRIES CO. LTD.	Drg. No. CA-289326	Lang. EN
00	Original	Tariq	01/13							Page 34	Pages 35
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HD4

DOC. No: 1VCZ400054

Figures: 1, 2, 3, 4, 7, 9, 14, 22, 32, 51

CB OPEN, TRUCK IN SERVICE POSITION, SPRING NOT CHARGED



SPARE TERMINALS

- X2 ϕ_{33}^B ϕ_{34}^B ϕ_{35}^B ϕ_{36}^B
- X3 ϕ_{12}^B ϕ_{13}^B
- X4 ϕ_{21}^B ϕ_{22}^B ϕ_{23}^B ϕ_{24}^B ϕ_{25}^B
- X5.1 ϕ_{63}^B ϕ_{64}^B ϕ_{65}^B ϕ_{66}^B ϕ_{67}^B ϕ_{68}^B ϕ_{69}^B ϕ_{70}^B ϕ_{71}^B ϕ_{72}^B ϕ_{73}^B ϕ_{74}^B ϕ_{75}^B ϕ_{76}^B ϕ_{77}^B
- X7 ϕ_{64}^B ϕ_{65}^B ϕ_{66}^B ϕ_{67}^B ϕ_{68}^B ϕ_{69}^B ϕ_{70}^B
- X11 ϕ_{15}^B ϕ_{16}^B
- X12 ϕ_{18}^B ϕ_{19}^B
- X13 ϕ_{21}^B ϕ_{22}^B
- X14 ϕ_{12}^B ϕ_{13}^B
- X52 ϕ_{40}^B ϕ_{42}^B ϕ_{47}^B ϕ_{48}^B ϕ_1^B ϕ_{16}^B ϕ_{27}^B ϕ_{37}^B
- X87 ϕ_9^B ϕ_{10}^B

DESIGNAT.	FIGURE	DESCRIPTION	DESIGNAT.	FIGURE	DESCRIPTION
-MS	Fig.1	MOTOR FOR SPRING CHARGING	-PG	Fig.14	GREEN LED - NORMAL GAS PRESSURE
-BS1	Fig.1	CLOSING SPRINGS DISCHARGED	-PY	Fig.14	YELLOW LED - LOW GAS PRESSURE
-MC	Fig.2	SHUNT RELEASE ON	-PR	Fig.14	RED LED - INSUFFICIENT GAS PRESSURE
-RL1	Fig.3	BLOCKING MAGNET AGAINST CB CLOSING	-BS2	Fig.22	CLOSING SPRING CHARGED
-RL2	Fig.4	BLOCKING MAGNET AGAINST TRUCK MOVING			
-MO1	Fig.7	FIRST SHUNT RELEASE OFF	-BB1	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR1	Fig.7	RECTIFIER FOR COIL -MO1	-BB2	Fig.32	AUXILIARY SWITCH CB SHAFT
-MO2	Fig.9	SECOND SHUNT RELEASE OFF	-BB3	Fig.32	AUXILIARY SWITCH CB SHAFT
-TR2	Fig.9	RECTIFIER FOR COIL -MO2	-BT1	Fig.51	CB TRUCK IN SERVICE (CONNECTED) POSITION
-KA1	Fig.14	AUX. RELAY - LOW GAS PRESSURE	-BT2	Fig.51	CB TRUCK IN TEST (ISOLATED) POSITION
-KA2	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XB		58-POLE PLUG FOR AUXILIARY CIRCUITS
-KA3	Fig.14	AUX. RELAY - INSUFFICIENT GAS PRESSURE	-XG		GROUND TERMINALS

01 As per comments		Tariq 14/13	<div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> </div>	Prepared Tariq		Date 30.12.2012	<div> <div>INCOMING 100MVA FEEDER (1875)</div> <div>HD4 INTERNAL WIRING</div> <div>ABB ABB ELECTRICAL INDUSTRIES CO. LTD.</div> </div>	ABB Job No. N106931.004		= AG18
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Rev. Description		By Wk/Yr		Project name		132/33kV # S/S-8501 ZS3.2		Design No.		Lang. EN
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										Pages 35